THE IMPACT OF INFORMATION / DECISION SUPPORT SYSTEMS (I/DSS) IN DEBT MANAGEMENT

The Egyptian Experience

Ashraf E.S. Hassan

Department of Information Systems

The London School of Economics and Political Science

Submitted in fulfillment of the requirements for the award of the degree of Doctor of Philosophy from the University of London

December 1998

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

Table of Contents

Chapter III Theoretical Background

Part 2

Chapter IV Strategic decision making & Debt acquisition process in Egypt: "The before stage"

Chapter VI Analysis of the Egyptian I/DSS Debt Management Program

Part 3

Chapter VII An I/DSS Debt Management Executive Framework

Chapter VIII Research Findings, Generalizations and Future Research

List of Tables

List of Figures

ABSTRACT

The introduction of technology-based tools into developing countries is usually impeded by a number of potential problems. The problems become murkier when the context of the issue, such as external debt management, where technology is to be used, does not have a standard textbook of rules and procedures to follow.

The principle problems encountered during the course of our research for this thesis hinged the issue of possible inapplicability of information technology (IT), especially information and decision support systems (I/DSS). This is also the case for other tools and techniques built and used by developed countries in the developing world. The great deal of difference in the context of use; content of the systems; and the attitudes of the parties involved in the process forms the basis for our argument.

The research was intended to draw on the lessons learned by the Cabinet Information and Decision Support Center (IDSC) during the introduction I/DSS for improving the decision making process in developing countries. Moreover, the research intended to tackle the issue of using I/DSS in a totally new context, other than for very structured purposes such as manufacturing and the like, and a challenging environment such as those in developing countries where difficulties of implementation and use are more in context, content and cultural issues than technological ones. The research would then show implications, identify problems and challenges and try to develop generalizations and recommendations.

The research, since its initial phases, had to consider the forces of centralization versus decentralization and the organizational structure of decision making especially at the top level. Other issues such as I/DSS project planning and implementation; organizational dynamics and the research at the organizational level related to national policy;

and technical information systems development were taken into consideration.

This experience could be viewed as a documentation phase where the Egyptian Cabinet IDSC and the Central Bank of Egypt (CBE) together have built, implemented and sustained state-of-the-art I/DSS in the process of establishing a powerful Egyptian debt management office. The analysis of these experiences displays many lessons for the implementation of sophisticated systems under conditions of extreme difficulty. It offers insight into a number of problems that concern designers, implementors, users, and researchers in I/DSS use in managing development planning and socio-economic change especially in developing countries. It also delves into important aspects related to project planning and implementation, organizational dynamics and the effective use of accurate, timely and relevant information in development planning.

We conclude this thesis with an analytical framework that gives detailed methods and guidelines for future implementation of similar programs in developing countries that might wish to benefit from the experience of the Cabinet of Egypt IDSC.

PREFACE

Working for the Cabinet, Information and Decision Support Center (IDSC) since almost its inception (April 1986) and the broad exposure to Information Technology (IT) related issues, problems and challenges triggered my desire to pursue postgraduate research studies in aspects of information technology in developing economies. Finishing my MBA in 1988 at the American University in Cairo (AUC) and working as a teaching assistant for the Information Systems (IS) Department also contributed to my curiosity in pursuing further studies in the field of information technology.

In 1988 I was promoted to head the Cabinet IDSC chairman's Planning and Control Department which basically filters everything to and/or from the Chairman of the Advisory Board of IDSC. By virtue of the position, daily contacts were developed with various IDSC projects managers in addition to my becoming more familiar with the issues and problems facing the developers and the users of IT in Egypt in the various sectors and on different organizational levels. Moreover, the base building phase of IDSC attracted such top experts in the field of I/DSS as Jay Nanimaker, Paul Gray, Ralph Sprague, Joyce Elam and others with whom I was directly assigned to work. The nature of my assignment was closely aligned with their process of learning about decision making in the Egyptian culture and also in transferring I/DSS know-how to the IDSC staff. Furthermore, I was fortunate to work directly with the chairman who, at the same time, was the professor I assisted at AUC, and to assist him in producing a number of research papers[1] written by him in coordination with several co-authors about

---

1

- El-Sherif, H., "Building Crisis Management Strategic Support Systems for the Egyptian Cabinet", RVB Research Papers, 10, June 1990.
- El-Sherif, H., "Managing Institutionalization of Strategic Decision Support for the Egyptian Cabinet", Interfaces, 20,1, January-February 1990.

IDSC as a unique experience in developing countries. I also attended a number of worldwide symposia and seminars such as ICIS, IFROS, TIMS and others where the Egyptian experience was presented and took part in even preparation.

By October 1992, I was provided with the opportunity to pursue further research in information systems. At that time, the topic of external debt management was at the top of my priority of interests. This was due to the major developments achieved in this arena by the Egyptian government during the Paris Club negotiations of 1987 and 1991 as a result of the debt management and economic monitoring (DM&EM) program developed and implemented by IDSC and the CBE[2]. Discussing with IDSC's chairman of the board[3] and with the program manager the possibility of covering this development and implementation as a research topic, they both agreed and shared with me the importance of studying the impacts of the DM&EM program specifically and its implications on I/DSS research and applications in general.

Working in the Cabinet IDSC provided me with the opportunity, the support and the facilities needed to embark on a full-fledged investigation of the initiation, development and implementation of the DM&EM program. Moreover, access to the decision and policy makers as well as the ease in communicating with the various parties involved in the program encouraged me to proceed with the research.

- El-Sherif, H., "Managing Large Information & Decision Support Systems Projects", IFORS, 1988, pp 130-144.
- El-Sherif, H. and El-Sawy, O., "Issue-based Decision Support Systems for the Cabinet of Egypt", MIS Quarterly, 12, December 1988.

[2] Though I was working for IDSC, I did not work directly with the DM&EM program.

[3] Though the Chairman of IDSC wrote a number of times about his studies and observations in developing and implementing I/DSS in Egypt, he was very much interested in the result of our work due to the fact that it is one of few indepth studies conducted for one of IDSC main programs.

Over the last 5 years, since I started this research, the DM&EM program has changed significantly in extent, size and achievements. The quality and quantity of its deliverables and services has surpassed the expectations projected in the project document. Moreover, the development of its new phases, its expansion both horizontally, into new sectors such as capital markets, and vertically into the management of internal debt (public and private), for example, has represented a great challenge to tracking its advances.

Questions like, What triggered the DM&EM idea? Who initiated, promoted and supported the idea? Who was the champion? What were the problems and challenges and how were they transformed into opportunities? What were the requirements and numerous other questions that represented the main objective of this research aimed at identifying the role played by IT at the economic development level in Egypt and attempting to generalize the experience so as to make it transferrable to other developing countries.

Above all, the issue of development, use and applicability of IT in developing countries was of great interest to me. Like many other developing countries, Egypt was faced with many challenges including the use of the latest IT in its rush for developmental capability. This thesis will present and analyze the realization process experienced by the Government of Egypt (GOE) as it began to appreciate the importance of I/DSS in its emerging attempts to manage its refined socio-economic developmental planning process. The focus of attention will be on the process of adopting, adapting and diffusing I/DSS in leveraging and supporting top policy and decision makers' decision making process, especially in critical policy and planning issues such as external debt management.

In other words, the objectives of this research could be expressed as follows:

- First, evaluate and present different debt management tools, techniques and models and the its applicability to different contexts. Identify the factors affecting the choice of a certain model or a combination of models and the implications of each. The review will include documentation for the Egyptian experience and the attempt made toward realizing a comprehensive external debt management function;
- Second, explore the cycle of IT transfer, localization and adaptation in the context of application with a special emphasis on state-of-the-art DSS which is a vital tool nowadays in the process of supporting top policy and decision makers;
- Third, inquire into and elicitate facts concerning the process of strategic decision making, structure of power and policy formulation at the Cabinet level in addition to assessing the role played by IDSC in mobilizing various resources to employ, adapt, adopt and diffuse various state-of-the-art technologies in the Egyptian context;
- Fourth, perform an in depth analysis and appraisal for the debt management and economic monitoring program to identify the direct and indirect impacts on various sectoral dimensions such as economic, social and political. In addition, study and measure the degree of contextual fit of the project as a dominant component in the overall structural adjustment programs. Moreover, examine the change in Egyptian negotiation power with creditors before and after the inception of the project; and
- Fifth, thoroughly analyze selected debt bilateral/multilateral negotiation cases, either for debt forgiveness or rescheduling, to include identifying detailed scenarios, spelling out different policy issues, and assessing various outcomes.

ACKNOWLEDGMENTS

This research would not have come to fruition without the continuous support, both moral and material, of my family back home. More specifically, I would like to thank my father for his contribution and sharing of his views, ideas and knowledge while I conducted this research; my mother who encouraged me to pursue further academic research after achieving my Masters of Business Administration; and finally my wife, who has helped pave the way and supported me in meeting the challenge.

Sincere thank also goes to the staff of the Cabinet, Information and Decision Support Center and the Central Bank of Egypt including their senior management levels, technical and administrative teams and especially the Debt Management and Economic Monitoring program team. They have been very supportive in facilitating the field research and have helped me greatly in organizing the field visits and in obtaining access to the documentation needed for the proper conduct of the research. Without their support, both in acquiring the research material and facilitating the interviews with top policy and decision-makers, the proper implementation of the interviews and the survey questionnaire would not have been possible.

I would like to thank my professor at the American University in Cairo and my direct supervisor at the Cabinet IDSC, Dr. Hisham El Sherif, together with Dr. Moatassem Kaddah, the DM&EM program manager, for being continuous sources of intellectual and moral support, at the academic, research and professional levels through the last few years. Equally important, I would like to thank my supervisor, Dr. Jonathan Liebenau, for his constant encouragement, moral support and cheerful attitude. His vast experience reflected in his ideas was extremely vital in stimulating thought assisting me in organizing the objectives of my research into a strong and disciplined thesis form.

Finally, I would like to thank my friends for their support, encouragement and efforts on my behalf as well as my work colleagues who were very supportive during the last five years. They have exerted all their efforts to render the working environment as smooth as possible in an attempt to contribute to my research in whatever way possible.

ACRONYMS

AFESD	Arab Fund for Economic and Social Development.
AMAC	Al Ahram Management and Computer Center.
AUC	American University in Cairo.
BIS	Bank for International Settlements.
BOP	Balance of Payment.
CAPMAS	Central Agency for Public Mobilization & Statistics.
CBDMS	Computer Based Debt Management System.
CBE	Central Bank of Egypt.
CSF	Critical Success Factors.
DBMS	DataBase Management Systems.
DFI	Direct Foreign Investment.
DPS	Debt Projections Subsystem.
DM&EM	Debt Management & Economic Monitoring.
DMFAS	Debt Management and Financial Analysis System.
DMS	Debt Monitoring Subsystem.
DMU	Debt Management Unit.
DRES	Debt Reduction Subsystem.
DRM	Debt Reduction Module.
DSM	Debt Strategy Module.
DSR	Debt Service Reduction.
DSS	Decision Support Systems.
EDT	Total External Debt.
EIS	Executive Information Systems.
EIU	Economic Intelligence Unit.
GDP	Growth Domestic Product.
GDSS	Group Decision Support Systems.
GIS	Geographic Information Systems.
GNP	Growth National Product.
GOE	Government of Egypt.

HLEC	High Level Economic Committee.
I/DSS	Information and Decision Support Systems.
IBM	International Business Machine.
IBRD	International Bank for Reconstruction and Development.
ICL	International Computer Limited.
IDSC	Information Decision Support Center.
IMF	International Monetary Fund.
IPCOM	Information Project Cabinet of Ministers.
IT	Information Technology.
LEDD	Loans and External Debt Department.
MGS	Import of Goods and Services.
MIC	Ministry of International Cooperation.
MILIC	Moderately Indebted Low-Income Countries.
MIMIC	Moderately Indebted Middle-Income Countries.
MIS	Management Information Systems.
MOEFT	Ministry of Economy and Foreign Trade.
MOF	Ministry of Finance.
MOP	Ministry of Planning.
NCR	National Cash Registers.
NPV	Net Present Value.
ODA	Official Development Assistance.
Non-ODA	Debt contracted on market terms.
OECD	Organization for Economic Cooperation and Development.
OSS	Organizational Support Systems.
PC	Personal Computer.
RES	International Reserve.
S&P	Standard and Poors.
SILIC	Severely Indebted Low-Income Countries.

SIMIC	Severely Indebted Middle-Income Countries.
SOP	State Owned Projects.
TDS	Total Debt Service.
TS	Technical Secretariat.
UNCTAD	United Nation Center for Trade and Development.
UNDP	United Nation Development Program.
WB	The World Bank.
XGS	Export of Goods and Services.

CHAPTER I
The Debt Problem & Egypt

A. Introduction

1. Problem Definition

The build-up of external debt by developing countries has been going on for a long time. It has been one of their strategy's cornerstones for economic and social development since the 1950's. For a number of reasons, however, the orderly process of borrowing for development got out of hand during the last 15-20 years which has led to the eruption of the debt crisis leading to serious implications in the world's financial systems. Nowadays, the world economic and financial systems are at stake. Debtors are facing a very difficult time in fulfilling their obligations, while creditors find it more risky to be involved with countries and institutions which are not capable of even servicing their debt. Developing countries' external debt amounted to US$ 1.6 trillion in 1993 and has increased yearly by about US$ 110 billion[1].

Developing countries resort to foreign financing to foster internal growth and to increase the resources available for investment. But before receiving foreign funds, plans must be made for how to repay them, and the limits such debt will impose on future economic policy must be considered. Investment projects financed with foreign debt should yield enough foreign currency to cover the servicing of the debt. In theory, therefore, debt management involves knowing the level of the debt, keeping it within the desired limits, and obtaining the best available terms for it. In reality, debt management is very different. First of all, public foreign debt has been used mainly to create (or maintain) fiscal deficits, caused not by greater public investment, but by higher

public current consumption or, in some cases, grandiose and unprofitable investments. Second, the volume of foreign debt incurred by a given country has been independent of the size of its current account deficit plus net foreign direct investment. The reason is that separate forces, detailed below, determine all three elements:

- The volume of debt in every period is mostly determined in the money market. It is a function of differential net borrowing costs as well as expectations regarding exchange and interest rates;

- The current account is determined in the goods and services market and varies according to domestic and foreign demand as well as the competitiveness of exports and imports for goods and services; and

- Net foreign direct investment depends mainly on the development of a real sector(s) of the economy (The World Bank 1990).

In most cases, the volume of foreign debt has been greater than the current account deficit plus net foreign direct investment, leading to a deficit. To hide this deficit, governments have preferred either to force the public sector or to encourage the private sector to obtain additional foreign financing. But these higher reserves, from an unnecessarily large foreign debt, have proved unprofitable. The cost of borrowing has been much greater than the return on the reserves because markets have generally exhibited a normal upward-sloping yield curve, with higher yield on debt of longer maturities, reserves have tended to be invested in short-term securities with lower returns. The result has been a serious debt-servicing problem, the "debt crisis", attributable in most countries largely to the absence of debt management.

---

[1] Debt Management and the Developing Countries, UNDP, July 1994.

Debt management should take place at two levels: the macro-economic and the administrative level. Macro-economic management is the most important since the management of the economy as a whole is the main factor in determining the volume of foreign debt. When more borrowing can no longer cover debt servicing, there are only two alternatives. One is to create a larger surplus in the trade and service accounts by reducing expenditures relative to output. The other alternative is normally to create a fiscal surplus. The reason behind this is that in developing countries most foreign debt is owed by the public sector while most foreign assets are held by the private sector (partly because private foreign investment has been a way of generating external income and evading exchange controls and taxes by not repatriating the principal). The debt-service problem is, therefore, more a fiscal issue than one related to the balance of payments. Turning fiscal deficits into fiscal surpluses could be called macro-economic debt management (The World Bank 1990).

B. Egypt

1. The Country

Egypt is one of a number of Middle Eastern countries which share Arabic as their common language and hold similar natural resources such as oil and natural gas. It was the cradle of an ancient civilization dating back to 3000 BC. Even today some of the symbols of its rich history, arts and crafts attract tens of thousands of tourists every year. With a population of about 61 million, Egypt is the most populous country in the Middle East region. Its population is growing at a rate of

2.3 percent annually. According to Howard Handy[2], Egypt's growth rate will reach 5% in the year 1997 and is expected to grow gradually to reach 7% by the end of this century. Egypt has a land area of 386,600 square meters of which a large part is desert. Its extent of urbanization is 43 percent with three large cities: Cairo, Giza and Alexandria[3]. Cairo, the capital of Egypt, is a large metropolis where buildings of French and English architecture stand next to modern skyscrapers. Cairo's 12 million inhabitants constitute nearly 20 percent of the total population.

Egypt has four basic sources of foreign exchange earnings. They are almost equally divided between tourism, oil, Suez Canal earnings and remittances of Egyptians working abroad, mainly in the Arab Gulf countries.

Egypt, like many other developing countries, is trying to expand its industrial base and modernize itself technologically. It is liberalizing its economy and has engaged in a massive privatization program targeting 392 large public sector organizations since the beginning of the 1990s. The gross domestic product (GDP) of Egypt in 1996 was 45 billion US dollars, with a growth rate of 4.9 percent[4]. The inflation rate has dropped to 7.2 % and the deficit in the national budget has reached 1.3 % of the GDP leading to a surplus in the balance of payment (BOP). Additionally, external debts service payment has reached 13.6 % of total export earnings[5].

---

[2] President of the Word Bank task force in Egypt and the Middle East - Interview by Yasser Sobhi for Al Ahram newspaper - The national newspaper of Egypt - Cairo, Egypt, 3 February 1997.

[3] Source: CAPMAS, Egypt, October 1996.

[4] Egypt's Economic Bulletin, The Cabinet IDSC, Cairo, May 1997.

[5] Dr. Youssef Botrous Ghali, Cabinet Minister for Economic Affairs and member of the High Level Economic Committee (HLEC) and the Egyptian economic negotiation team to the WB and the IMF, Al Ahram Newspaper, Cairo, 17 May 1997.

Agriculture accounts for 17 percent of the gross domestic product and industry accounts for 50 percent. The per capita gross national product is US$ 1,200 dollars per year. Egypt has a large service sector mainly built around tourism and transportation. Its major exports are human resource capacities, petroleum products, cotton and leather products; its major imports are food, machinery and vehicles. Its currency, the Egyptian Pound, has been stable towards major currencies during recent years.

Egypt has a highly centralized government with a Cabinet headed by a Prime Minister and consisting of a deputy Prime Minister, 28 ministers and the governor of the Central Bank of Egypt (CBE). The Cabinet has four main committees the members of which are different ministers each according to his specialization and area of work. These committees are the High Level Strategy Committee for Economic and Financial Affairs (HLEC); Production and Services Committee; Social Services Committee; and Legislative Affairs Committee. The Prime Minister coordinates the work of the ministries and policy is made in conjunction with the Supreme Court and the President.

The country is administered in provincial units, or governorates, through the office of the governor, an official of great power locally whom the Prime Minister, in his capacity as head of the governors' council, appoints.

On the economic side, Egypt was faced with a sharply deteriorating economy due to its involvement in a number of wars over a long period of time (1956 - 1973). This involvement led to a very weak economy mainly dependent on unhealthy external borrowing. In the coming chapters of this thesis, we will discuss such problems, the reasons behind them and how the problems were solved using information technology (IT) tools and techniques. Despite these setbacks, during previous years, the Egyptian economy has been

realizing major positive changes that have repositioned Egypt in the world economy. The "positive" surplus in balance of payment amounted to 1.2 billion US dollars for the year 1996; the deficit in the balance of trade is expected to reach 14% of GDP backed-up by a huge surplus of other sources of foreign currency. Moreover, Egypt's performance in fiscal reform was outstanding to the degree that the deficit in the national budget was reduced to 0.08% compared to the anticipated figure of 11% as indicated by World Bank (WB) experts. One of the major reasons behind this reduction is the decreased amount of debt service payment as a result of the Paris Club[6] reduction of external debt. This reduction also reflects the gradual restructuring of governmental expenditures towards funnelling most of the funds to service, health, and education sectors of the economy. Furthermore, the fiscal restructuring allowed the reduction of the inflation rate to only 6.2% this year; it is expected in the upcoming years that the governmental deficit will change to surplus with the continuation of such fiscal measures.

World Bank officials appraised the privatization problems in Egypt with 22 major companies being privatized. This move resulted in returns that are equivalent to 1.5% of the GDP, most of which will be directed to pay the internal debts of public sector companies to banks. The other portion will be directed to compensate the labor force that might have been harmed by such privatization undertakings. Additionally, these

---

[6] The Paris Club is the institution responsible about coordinating Creditors/Debtors country relationship especially when a debtor country faces difficulties in paying back its debt. In this situation, it is the Paris Club role to call upon the debtor country and its creditors and arrange for the necessary agreements (payment, re-schedulling, forgiveness,..etc.) to take place. It is also the Paris Club role to follow-up on the execution of such agreement and make sure that the debtor country is meeting its obligations. It is also the authority of the Paris Club, in case a debtor country fail to meet its obligations, to declare a debtor country state of bankruptcy and take the necessary measure to guarantee the payback of creditors through different means (such as, debt-equity swaps, debt conversions, ...etc). In 1987, Egypt was called by the Paris Club to meet with its creditors due to the heavy debt situation and the difficulties it was facing in servicing its debts.

officials have confirmed that service of internal debts is expected to decrease to 50% of the GDP during the coming year, which will certainly result in further reduction in the BOP deficit. The WB appraised the growth in the Egyptian stock market and pointed out that its prices don't seem extraordinarily high and that the price index in particular is still at a reasonable level (El Sherif 1996).

2. Information Technology in Egypt

IT was introduced in to Egypt in the 1960s. The evolution of IT in Egypt can be seen in three phases.

The first phase started in the early 1960s and lasted until the early 1970s and the industrial boom in various sectors of the economy. Computerization was an essential tool targeted by the government to fulfil its socio-economic plans. Though it was deemed important, it encountered major cultural and social problems as well as a resistance to change from senior government officials that remained unsolved at that time and constituted major barriers to the proper implementation of computer use and diffusion (Kamel 1994).

In the early 1960s, less than ten years after the introduction of the first commercial computer in the west, a number of developing countries such as Egypt and India, started to introduce and use IT, mainly computers, in different sectors of the economy (Lind 1986). Egypt was the first country in the Middle East to acquire a computer, when, in 1961, Alexandria University installed an IBM mainframe Model 1620. A few months later, the Institute of National Planning acquired the second mainframe computer in Egypt, also an IBM 1620. Next, the Central Agency for Public Mobilization and Statistics (CAPMAS) followed by installing an International Computer Limited (ICL) mainframe Model, 1904. The ICL computer was relatively advanced compared to the first two computers but it was large and needed a large room to accommodate it. In 1969, Al-Ahram Management and

Computer Center (AMAC), the first of its kind in Egypt or any other Arab country, was established (Kamel 1994). While the IBM computer at Alexandria University's Faculty of Engineering was used to introduce students and professors to this new technology, the computers of the National Planning Institute and CAPMAS were used for tabulation, accounting, stock control and financial systems. The computer at AMAC was installed to upgrade and computerize Al-Ahram newspaper's internal work structures. It was also intended to undertake computer applications for other institutions as a computer service bureau for corporations which could not afford to purchase their own computers or who did not have the qualified personnel to operate them effectively (Kamel 1994).

The diffusion of computers in this phase was monitored and regulated by the government. It represented a type of monopoly that was primarily meant to realize organizational performance and to support various sectors in the economy through the use of various IT tools and techniques in reaching a certain level of efficiency within the large government organizations. Until the 1970s, there were no local privately owned computer companies in Egypt. This was not only due to massive nationalization policies but also to the fact that, at that time, they were too expensive, too large and not yet perceived as necessary (Kamel 1994). During the 1960s, there were branches of three computer companies in Egypt: International Business Machines (IBM), International Computer Limited (ICL), and National Cash Registers, (NCR).

The IT second phase came with the economic "open-door" policy during 1974-75, in conjunction with the massive drop in prices of mini-computers worldwide. This phase was characterized by using computers for increased effectiveness after realizing organizational performance and efficiency during the first phase. It witnessed the

establishment in Egypt of a large number of representative offices of most international IT corporations. Consequently, Egypt took on the image of the Middle East information center. Egypt's highly qualified technicians, prospective computer users and the surge in incomes that accompanied the oil boom in the late 1970s fostered this. Consequently, in the second half of the 1970s, the value of the information technology market in Egypt was within the range of US 20 to 30 million dollars (Kamel 1994). By the early 1980s, personal computers became accessible to more individuals, universities, schools, research centers and private firms. Personal computers become more and more popular in Egypt in the 1980s, the dramatic increase seemingly attributable to the localization (Arabization and adaptation of programs to local context) of software applications. The majority of users in Egypt and other Arab countries prefer to work on Arabic-based applications. As a result, a new business sector consisting of software companies was formed to provide a variety of IT-related services.

The second phase of computing lasted until the mid-1980s and witnessed the spread of computer companies in Egypt and the orientation and marketing of their IT services including training and human resources development, systems development and maintenance, as well as information systems evaluation and assessment. The role of IT during that phase was primarily intended to provide management support with regard to decision making and improving effectiveness (Kamel 1994).

Phase three started in 1985 and represented a shift in the perception and use of IT in Egypt. The Egyptian market was liberalized, leading to a vast increase in the number of multinationals, vendors and local software houses in the market. IT has been perceived as a re-positioning tool for organizations in an ever-growing competitive market where almost all decision resource allocation functions are

complex and directly affect the competitiveness status and position of a company.

In 1981, a presidential decree was signed stipulating that all government entities, including public sector organizations, should establish computer centers on their premises to improve their productivity. Over a short period of time, computer centers were established in most ministries and public sector companies. The decree represented the initial embarkation of the Government of Egypt (GOE) on a national program for the establishment and development of an informatics, electronic communications industry.

Phase three witnessed the involvement of a new customer in the market with new ideas, strategies and plans, namely, the government. It re-defined the role of IT within the context of socio-economic development planning believing in its enormous impact in such areas. From its side, the GOE has been striving to implement a nation - wide strategy to support the realization of its targeted socio-economic development objectives. By mid-1985, the Cabinet Information Decision Support Center (IDSC) had been established as a "think tank" attached to the body of the Cabinet. It adopted a far-reaching supply-push strategy to improve Egypt's managerial and technological infrastructure. Its strategic objective was the introduction, adaptation, adoption, use and diffusion of information technology at all levels of the government starting with the Cabinet, its high level committees, all ministries, governorates, and government organizations. To fulfill these objectives, the strategy implemented by the government included the following:

- development infrastructure for informatics and decision support,
- supporting and developing the software service industry, and
- development of a high-tech industrial base in the areas of electronics, computers and communications.

Consequently, within the broader and intensive national plan for administrative and technological development, IDSC realized the importance of establishing a comprehensive national information master plan which spelled out the government's development requirements. This plan was translated into implementing 450 sizable informatics projects and programs. It aimed at leveraging and supporting decision making, and increasing productivity in a number of economic, social, managerial and technological domains that are vitally important for Egypt. The common objectives of the programs included:

- First, to develop information and decision support systems for the Cabinet and top policy makers in Egypt.
- Second, to support the establishment of decision support systems/centers in different ministries and make more efficient and effective use of the available information resources.
- Third, to initiate, encourage and support informatics projects that could accelerate managerial and technological development of Egyptian ministries, sectors and governorates.
- Fourth, to participate in international cooperation activities in the areas of information and decision support.

However, with the spread of computer use and the proper orientation provided for decision markers, other important end-users in various sectors became primary users of computers in Egypt. For example, in 1992 petroleum companies accounted for 15%, banks 18%, public sectors & government 18%, private sector 17%, universities 12%, hotels 10%, and hospitals 10% of total computer use[7]. It is estimated that Egypt

[7] CAPMAS, 1992.

has achieved only 10 percent of its computerization potential by installing approximately 156,000 computers in the public sector, government agencies and offices, as well as in the private sector. The demand for microcomputers is expected to grow at an average of 20% a year.

Encouraging IT introduction and diffusion, the government has recently encouraged imports through imposing only 5% customs duty on hardware and software, reduced from 30% custom during September 1997. As a result, a sizable increase in the IT market was realized and increased from 25 dealers and about 70 sub-dealers and retail outlets in 1985 to over 1,080 international brands, 320 dealers, about 4,500 sub-dealers and over 650 training centers in 1997[8]. As is the trend in most developing countries, government and public sector institutions are by far the largest purchasers (estimated at 38%).

Furthermore, In 1993, a national decree was initiated by the Cabinet IDSC and implemented by the Ministry of Justice to support software copyright laws and prevent software piracy and illegal importation. The current computer market in Egypt is estimated to be around 150 million dollars, and is expected to grow to US 230 million dollars in the year 2000.

Consequently, the information technology industry in Egypt has witnessed major developmental leaps since the mid-1980s. A number of its components such as electronics, hardware and software have been gaining wider attention from both the business sector and the political arena. This has resulted in the development and implementation of a set of procedures that were established to boost information technology with its various components. However, the size of the overall information technology industry indicates that it is far from

[8] CAPMAS, 1997.

being well-grounded and well-established as a strong production outlet contributing to the national economy.

3. The Debt Problem

Egypt is just one of many countries that has been challenged with a growing debt management problem impeding its economic development. It accumulated a government foreign debt of US$ 33 billion during the 70's and 80's, much needed funding to rebuild its economy and modernize the country after adopting the long-awaited Middle East Peace Agreement; the figure reached US$ 44 billion by 1990. Egypt at that time, was considered among the world's top five debtors in relation to the GDP. Furthermore, if fully serviced, the interest and repayment of principle would have consumed more than half of the country's export revenues.

In addition, since the mid-1980s the Egyptian economy has been experiencing a growing scarcity of foreign exchange resulting from sharply deteriorating external conditions. The difficult balance of payment situation of recent years has caused Egypt to assume a rapidly increasing external debt burden. It is estimated that debt service in 1985 was over 25 percent of Egypt's total export earnings.

To ensure that Egypt's international credit worthiness is maintained, external debt needs to be carefully managed. This requires not only that debt service obligations are paid on time but also that new debt is contracted on terms and in amounts which are compatible with Egypt's payback capability. Proposed new borrowing needs to be analyzed in the light of existing obligations before being approved. Policy makers, therefore, require information on the debt service profiles of existing debt; disbursement projections for committed but un-disbursed funds; available sources of financing and terms; and immediate payments obligations.

Prior to 1986, debt management was divided among a variety of

offices in the Egyptian government including the CBE, Ministry of Planning, Ministry of International Cooperation, Ministry of Finance, Economy, Defense and others. The Central Bank approved and monitored suppliers' and buyers' credit and short term borrowing by the public sector. The Ministry of Planning and International Cooperation negotiated most project-related loans to the central government and was responsible for monitoring the use of loans. These loans were primarily from bilateral and multilateral sources and were frequently multi-sectoral in nature. The Ministry of Finance was responsible for issuing payment orders for all external loans paid from the central government budget and computing the corresponding Egyptian pounds. The Ministry of Economy and Foreign Trade was responsible for formulating the foreign exchange budget, including the anticipated level of disbursements and debt service in respect to external obligations. Finally, the Ministry of Defense was responsible for negotiating external loans and monitoring debt service obligations in respect to military programs. Each entity kept records for its own purposes with little or no awareness of the need for regular exchange of information or of the overall debt picture. Though this seems to depict the system as very organized and well-structured, the reality was that this was a very theoretical setup and there was no real central coordination point where actual debt management functions were performed.

Within the Central Bank, external debt data arising from the operations of the entities mentioned above was collected in several operational departments. This information was mainly centralized in the Loans and External Debt Department (LEDD) in the Central Bank in files and registers maintained manually. Though computer systems had been present for a long time, they were only used as a store for information being received from various sources. Surprisingly, information was

printed out of the computer, manipulations were performed manually, and results were punched back into the computer if the system allowed. This manual process was very slow, inaccurate, and very inflexible to any changes required by decision makers. This body of information could not be made use of conveniently in order to forecast external payment obligations, when, for example, exchange rates and international interest rates varied frequently and the manual system lacked flexibility to accommodate it. Similarly, flexible aggregation of external debt data, which was required for balance of payment analyses and foreign exchange budgeting, was cumbersome and time-consuming. Consequently, the type of comprehensive debt reports, so vital to economic planners and policy makers, were not available or were too late to support a decision at the critical time (Hassan, 1994).

In response to the need for immediate improvement, the situation was properly analyzed and simple immediate solutions were recommended:

1. Increased control and monitoring of external debt operations and improvements in the approval and disbursement process;
2. Centralization of the data base on the external debt of the country in the LEDD and its computerization; and Better flow of regular reports on external debt operations to the several agencies involved in formulating and implementing policy in this area.

By 1985, the GOE had formulated a comprehensive reform program aimed at rationalization of debt utilization and reduction of the debt burden. An inter-institutional framework was formulated and a number of projects were initiated as part of a global structural adjustment program. It included liberalization of the economy and a comprehensive structural adjustment plan. Continuous consultations and discussions with the International Monetary Fund (IMF), World Bank

and other lenders took place in order to help mobilize the needed resources to close the external resource gap.

Successful management of the resource gap is at the crossroads of economic recovery. In addition to the implementation of sound macro-economic policies to affect favorably key variables in the external trade accounts, improved balance of payments performance is also dependent on strengthening external debt management. In recent years, factor services (interest payment) and principal debt repayment have grown in proportion to other items. Although the country's general stock of debt cannot be modified except in a program of debt rescheduling, external liabilities management can help achieve, over time, a net debt reduction through better targeting of net borrowing for productive purposes, debt conversions (debt swaps) and risk management mechanisms.

Our research will consider the structural adjustment program covering debt management function re-creation for the GOE. The aim in studying the Debt Management and Economic Monitoring (DM&EM) program is to assess the impact of using information and decision support systems[9] (I/DSS) capabilities in helping to solve a chronic problem faced by many developing countries.

C. Thesis outline

This research addresses the problem of external debt management in developing countries. It explores how Information and decision support systems could be used to help solving such chronic problem. It will focus on assessing the impact of development, implementation, and use of timely and accurate information systems for supporting the decision making process of top policy and decision makers involved the management of external debt. It we study whether the success of

[9] Defined in Chapter III, P.60

a debt management program is heavily dependent on a robust debt management system or not.

The research approach is to assess such impact by exhaustively studying two organizations that stand at the forefront of integrating the Egyptian debt management system (presented in details in chapter V). Those two organizations are: the Central Bank of Egypt (CBE), which has the primary responsible for the country's debt functions, and the Cabinet Information and Decision Support Center. The latter has acted as a state of the art IT "think tank" attached to the Cabinet and has focused on major strategic socio-economic developmental objectives. In 1986, both organizations began the process of developing a fully-fledged I/DSS for external debt monitoring. The system was designed jointly by IDSC and CBE and solely managed by CBE trained staff. The system now contains a database of some 4,500 loans from a large number of creditors representing about 15,000 schedules. The database was a necessary prerequisite to permitting the development and institutionalization of an effective external debt management function. In 1985, several challenges and problems were apparent including;

- Poor and fragmented manual data management systems for loans and their disbursements;
- Lack of coordination among institutions at the national level regarding loan utilization and debt repayment;
- Poor integrity of debt information;
- Conflicts between international creditors and national institutions;
- Acute shortages in supply of reasonable terms for new loans;
- Over-utilization by some sectors of loans, and under-utilization of others;
- Absence of managerial systems for monitoring and control of debt repayments; and finally,

• Effective management of current and future debt portfolios.

According to the Cabinet IDSC chairman "some of the difficult challenges viewed in the mid-80's were overcome by 1988. A fully comprehensive database and an information system was built for Egyptian debt, and linked to all key users around the debt reform program. Inter-ministerial coordination was enhanced significantly. Problems with international and multi-national creditors shifted from questioning the data and information to more objective dialogue of how reform could actually be achieved. In 1988, Egypt realized another challenge, namely the importance of building and institutionalizing debt management capabilities and organization within the central bank to help develop not only new borrowing strategies, but also to identify optimum debt portfolios. Models for generation of the selected optimum portfolios from the current ones were explored. They included the consideration and combination of new debt issues, while taking into consideration existing debt and swaps of both new and existing debt issues. Models were developed for integrating the client views, sometimes consisting of several scenarios, thus generating a set of transactions which form the basis for the borrowing strategy for the subsequent period until the next optimization. One of the goals was to minimize the overall future burden. In May 1991, the Government of Egypt succeeded in reducing the debt by 50% through a phased implementation approach, over a four years period, starting with 15% reduction during the first phase. The debt management program team formed the "back room" (kitchen as they describe it) supporting the Paris Club negotiations with various creditors. The savings for the Egyptian economy have amounted to more than US$ 10 billion. The team developed DSSs, which resulted in what was perceived as a national achievement." (El Sherif, 1996)

The proposed research explores and studies the impact of information

technology and especially information and decision support systems, and tries to assess social, economic and managerial implications, in supporting top debt management policy and decision makers in a national context. IT will highlight the roles and responsibilities of the key players involved in addition to the changes in organizational structure / dynamics that resulted from the implementation of this system, if any. The goal of this research is to construct an analytical framework that compares and contrasts the different debt management systems, their prerequisites, and dimensional impacts with a view toward applying the findings to other countries depending on their specific conditions. It is hoped that this thesis will demonstrate a replicable experience, which can be practically applied to help in solving one of the 1990's chronic challenges for developing countries. A thorough analysis of our observations and finds will be presented in chapter VI.

D. Thesis Divisions

The research conducted on the DM&EM program with its ideas, phases and findings will be presented in three parts. The common focus of the investigation carried across the different chapters will be directed towards studying the main theme of the thesis: the impact of Information/Decision Support Systems (I/DSS) in debt management in developing countries, especially with the Egyptian experience.

Part 1 is divided into three chapters. Chapter I discusses the debt problem and Egypt and provides historical background on the evolution of the debt problem in Egypt with its various phases and uses among private and public sector organizations. It also reflects the status of information technology in Egypt coupled with the emergence of a need to introduce state-of-the art IT tools and techniques, not only to diffuse the use of IT but also to use the best relevant technology to boost the socio-economic development programs through the rationalization of the decision making process. Chapter II describes the

theoretical foundations of external debt and debt management challenges together with decision making and decision support systems research. It provides the research method, techniques, data collection methods, research plan and the conduct of the research. Chapter III covers the theoretical foundation of our thesis including decision making, information and decision support systems and debt management evolution and debt management systems available worldwide.

Part 2 consists of Chapters IV, V & VI covering the period before and after implementation of the DM&EM program. Chapter IV covers strategic decision making with respect to its information and decision support requirements and the decision making process at the Cabinet of Egypt level. It also discuses the debt acquisition (borrowing) process used by the GOE before DM&EM program realization. Based on this historical background, the chapter touches on the establishment of the Cabinet IDSC including its mission and objectives, management approach and challenges faced. Chapter V covers the GOE experience in implementing large I/DSS programs dealing with leveraging and supporting decision making, mainly at the strategic level, in solving Egypt's chronic debt problem. It covers, in depth, the program, the Egyptian debt management office, and the debt management system used, in addition to the program challenges faced and the lessons learned. Chapter VI presents the program's impact and gains on both the national and the international sides.

Part 3 contains the last two chapters, VII & VIII. Chapter VII covers our proposed accelerated approach to I/DSS debt management executive framework implementation. This approach reflects the result of our empirical research, and our contribution to the field of I/DSS in debt management. The last chapter reviews the research findings and includes an analysis of DM&EM program implementation phases and

generalizations of the research findings as deduced from the development and implementation of large information and decision support systems in a developing country. Finally, future research opportunities that relate to the use of I/DSS in unconventional settings such as those documented in the literature are discussed.

E. Conclusion

The debt problem in developing countries is reported to be one of most severe crises in the 90's for almost all developing countries. Egypt's external debt amounted to US$ 1.6 trillion in 1993 and is increasing yearly by about US$ 110 billion. This increase has taken place in the context of dramatic changes in IT since the mid-1980s. These changes are reflected in the use and diffusion of various IT tools and techniques in most public and private sector organizations.

Being a developing country, Egypt was severely hurt by the debt problem in its attempt to re-build its economy after a number of wars. It was also faced with the challenges of introducing and diffusing IT in order to encourage the country to use state of the art information technology thereby assisting in the realization of socio-economic development and growth. This massive introduction of information technology was coupled with major government commitment and a comprehensive build-up of an information culture nation-wide that was carried out by the government and disseminated into various organizations both at the central and local levels.

The IT culture was introduced through a number of channels such as:

- the formulation of government regulations and policies for import of software, hardware and telecommunications components;
- the promotion of training and professional development within IT related areas;
- the development of educational curricula for different school and university levels; and

- the establishment of an information infrastructure to support the country's development objectives.

During the last twelve years (since 1985), the GOE has embarked on a nation-wide economic reform program. The basis of this program was a comprehensive debt management function that made use of wide diffusion of information technology within the various sectors of the economy.

This thesis will begin with the historical background of the external debt problem and the dissemination of information technology in Egypt. This background will then be used as a base for the forthcoming parts of the thesis which cover the experience of the Egyptian government in using I/DSS in supporting and leveraging the decision making process especially at the top strategic level. The research will focus on the current implementation of information technology applications in various ministries, the CBE, government offices and other related institutions concerned with the debt management function in Egypt.

CHAPTER II
Theoretical Foundation & Research Methods

A. Introduction

Chapter II of this thesis covers our research methods and the theoretical foundations for the research. It describes how our research was influenced by information systems literature, especially the theoretical foundations of decision support systems. It will discuss the reasons for which they were developed, which significantly differ from those for which they were implemented. While decision support systems were initially developed for corporate operations focusing on profit-related activities and market trends, in this thesis they are used as tools for government support in strategic decision making for socio-economic and development planning purposes in public administration (Kamel, 1994) and economic reform activities.

Our research findings and generalizations were deeply influenced by the programs, projects, applications, lessons learned and the experience gained by the Cabinet IDSC. It is also affected by the research and practical experience of our colleagues, Dr. Hisham El Sherif and Dr. Sherif Kamel, whose work was influenced by a number of theories, mainly Critical Social Theory, Phenomenology and Human Activity Theory.

Our research used a comprehensive empirical evidence gathering techniques and methods such as questionnaires, interviews, likert scale, analysis of official documents, ..etc. Such research methodology was chosen to satisfy the following: -

1. Yielding maximum information possible (due to the lack of documentation on debt management and debt management systems, sensitivity of the topic, and the difficulty of finding/meeting debt management decision makers;

2. Ability to cross-check the gathered information (by asking the same interview questions but a likert scale or questionnaire);
3. Ability to generate both qualitative and quantitative information; and
4. Ability to preciously describe situations and record changes and observations.

This chapter will detail the research plan, which will lead to the analyses of the findings and the development of generalizations and conclusions in later chapters.

This research was meant to be useful for future I/DSS researchs and applications conducted in developing countries specially those related to information handling and the design and delivery of decision support systems for development. It will try to provide useful guidelines for future development and implementation of large information and decision support system applications in the context of developing countries. It is also meant to be useful in the context and implications of future phases of the DM&EM program.

Finally, this chapter includes a survey of the literature on debt management practices and debt management systems currently available and in use. It also includes a survey of information systems development and implementation with focus on decision support systems and their use in various contexts.

B. Theoretical Foundation

1. Decision Making and Decision Support Systems

One theory affecting our research was the decision making theory as a framework for decision support systems research developed by numerous scholars. Perhaps no other management topic has received as much attention as management and organizational decision making. In classical decision making theories of what managers do,

decision making is often seen as the center of managerial activities, something that engages most of the time of managers (Kamel, 1994). There exist several organizational / institutional levels that correspond to the different types of decisions made in organizations. Using Anthony's categories, decision-making activity in an organization can be divided into three types: strategic, management control (tactical), and operational control (Kamel, 1994).

Strategic decision making is concerned with objectives, resources, and policies of the organization. Tactical decision-making (management control) is principally concerned with how efficiently and effectively resources are utilized and how well operational units are performing.

Operational control involves making decisions about carrying out the specific tasks set forth by strategic planners and management. While studying the DM&EM program, the research was partially inspired by the decision-making theory since this program represents a new form of decision support-based organization in a developing country such as Egypt.

The research was affected by the topologies of human problem solving characterizing each level. Decisions are usually classified as either programmed or non-programmed (Gray, 1987). Elsewhere in the literature, these decisions are referred to as structured and unstructured; we will use the latter terms here. Unstructured decisions are those in which the decision-maker must provide judgment, evaluation and insight into the problem definition. They are novel, important, and non-routine, and there is no well-understood nor agreed-upon procedure for making them. Structured decisions, in contrast, are repetitive, routine, and involve a definite procedure for handling them so that they do not have to be treated each time as if they are new (Gorry and Scott-Morton, 1971).

According to Simon, there are four different stages in decision making: intelligence, design, choice, and implementation (Table II-1).
Intelligence involves identifying the problems occurring in the organization: why, where, and with what effects. This broad set of information-gathering activities is required to inform managers how well the organization is performing and where problems exist. Traditional Management Information Systems (MIS) that deliver a wide variety of detailed information can be useful especially if they are built to report exceptions (with the added ability to call up text and additional detailed information).

TABLE II -1
Stages in Decision Making,
Information Requirements, and Examples[1]

Stage of Decision Making	***Information Requirement***	***Example***
1. Intelligence[2]	Exception reporting	MIS
2. Design	Simulation prototype	DSS
3. Choice	'What-if' simulation	DSS; large models
4. Implementation	Graphics, charts, decision aids, Gantt charts, etc.	Microcomputer & mainframe

The second phase of decision making involves designing numerous possible solutions to the problems. This activity may require more

[1] Gorry and Scott Morton, 1971.
[2] Includes problem definition, please see figure II-1.

intelligence to decide if a particular solution is appropriate. Here more carefully specified and directed information activities and capabilities focused on specific designs are required. Simple DSS systems running on smaller computers (PCs) are usually preferred because they operate on simple models, can be developed quickly, and can be operated with a limited data set.

The third stage involves choosing among alternatives. Here a manager can use information tools that can calculate and keep track of the consequences, costs, and opportunities provided by each alternative designed in stage 2. A larger DSS system is required because of the need to develop more extensive data on a variety of alternatives and the complexity of the analytic models needed to account for all of the consequences.

The last stage in decision making is implementation. Here managers can use a reporting system that delivers routine reports on the progress of a specific solution, some of the difficulties that arise, resource constraints, and possible best actions to choose from. Support systems can range from very highly complex MIS systems to much smaller systems and project planning software operating on microcomputers.

Table II-1 illustrates the stages of decision making, the general types of information required, and a specific example of an information system corresponding to each stage. In general, stages of decision making do not necessarily follow a linear path from intelligence, to design, choice, and implementation. At any point in the decision-making process it may be necessary to loop back to a previous stage (Figure II-1). For instance, one can often come up with several designs but one may still not be certain whether a specific design meets the requirements for the particular problem.

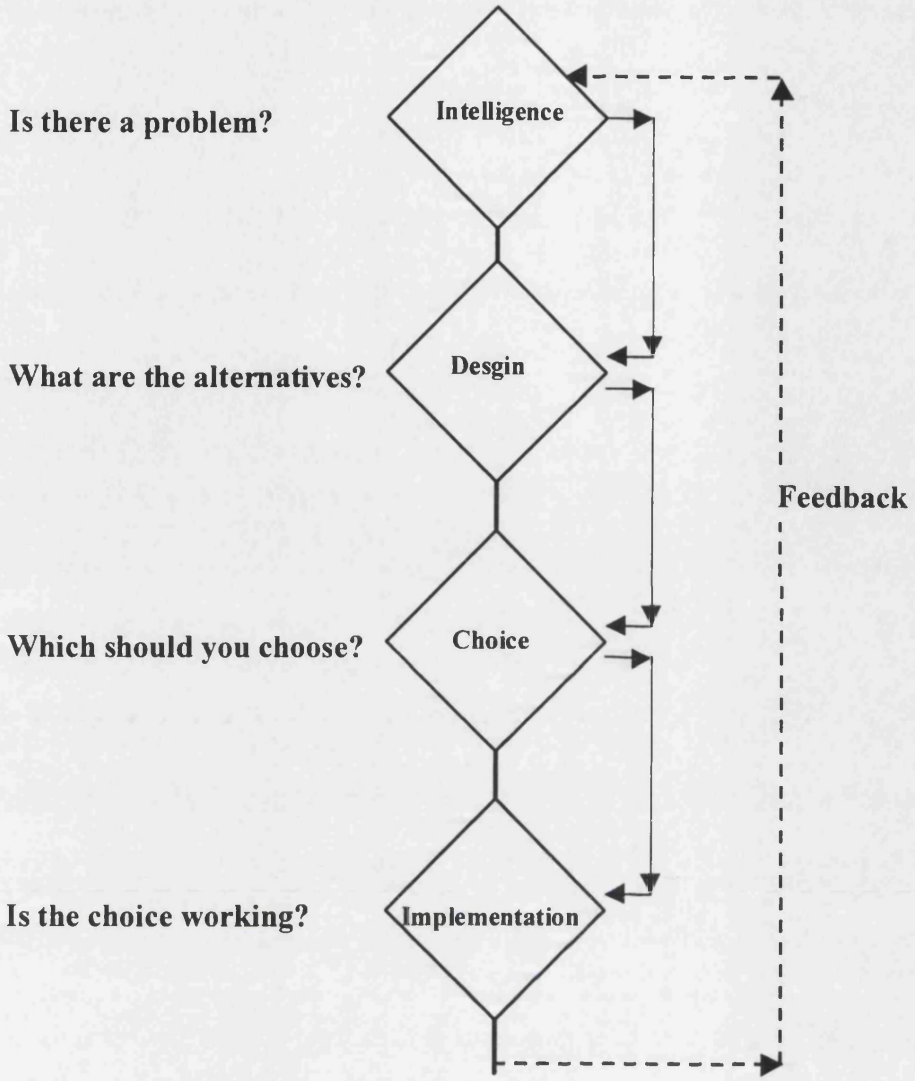


Figure II - 1

The Decision Making Process[3]

Decision support systems foundation and methodologies are mainly concerned with these two typologies of decision making, one based on levels in the organization and the other on the nature of human problem solving, which have been combined to form a decision support typology (Gorry and Scott-Morton, 1971). Theoretically, operational control personnel deal with fairly well-structured problems. In contrast, strategic planners deal with highly un-structured problems. Nevertheless, our research has tackled the inter-connectivity between

[3] Gorry and Scott-Morton, 1971.

the different level of the organization and has addressed both the structured and unstructured problems contained therein.

These systems were also interactive, that is, designed to help end users utilize data and models in order to discuss and make decisions (not solve) concerning semi-structured and unstructured problems (Keen, 1976; Henderson and Schilling, 1985).

A typical DSS has three components: a database, a model base, and a software system to integrate components and communicate with the user (Sprague and Carlson, 1982) (Figure II-2).

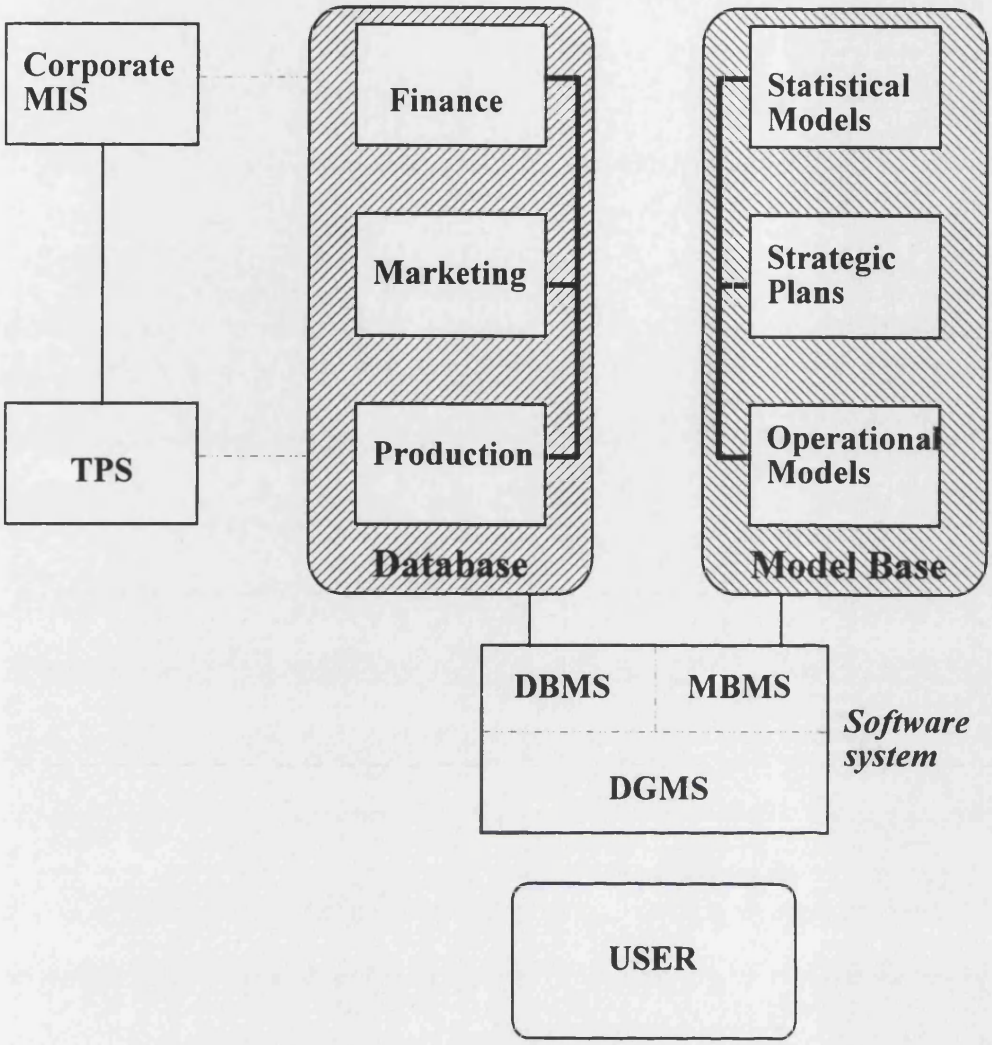


Figure II-2

DSS Components[4]

KEY: DBMS = Database management system

MBMS = Model base management system

DGMS = Dialogue generation and management software

The research was highly influenced by the above DSS architecture and was focused on testing its contextual fitting with the DM&EM program. Moreover, a considerable part of the research was spent in

understanding the relationships between DSS and the organization's existing Transaction Processing Systems (TPS) and MIS.

In the literature, most DSSs are linked closely to existing corporate information flows. More commonly, however, DSS are isolated from major organizational information systems. DSS tend to be stand alone systems, developed by end-user divisions or groups not under central information systems control (Hogue, 1985).

While early DSS were aimed at senior management, current users of DSS are found at middle-management levels (they could be the support staff or assistants to senior management). A well-designed DSS can be used at many levels of the organization. Since most decisions are made collectively, decisions must be coordinated with several groups before being finalized, regardless of organizational model used. Our research focused on large organizations where decision making is inherently a group process, and DSS can be designed to facilitate group decision making. An organization-wide DSS should permit different groups, using different assumptions, to analyze the same problem and come up with interesting, unique answers (Henderson and Schilling, 1985).

The approach used in researching the DM&EM program for the Egyptian government in particular and the other nation-wide DSS projects, implemented by the Cabinet IDSC, benefited significantly from the emergence of micro-computers in the 1980s and desktop workstations in the late 1980s. Through the emergence of this technology, early DSS theories were realized. With the new information architecture, it is at least technically possible to provide end users with access to very large databases, analytic models, and user-friendly interfaces. In addition, the technical possibility now exists to provide decision support to groups and entire organizations. These technical

---

[4] Sprague and Carlson, 1982.

advances revolutionized end-user expectations. Batch reports put out by MIS departments simply could not match the appeal of interactive terminals under user control analyzing corporate data with the aid of powerful statistical models.

Though there are a number of different types of DSS that have emerged, (explained at more length in Chapter III) the focus of our research is on issue-based DSS[5], which has been used successfully in a number of projects and programs by the Egyptian Cabinet IDSC (El Sherif and El Sawy, 1988).

Decisions on a number of organizational issues are prerequisite to developing a DSS; certain questions must be answered. Questions like, who will take responsibility for the development and guidance of DSS? Should DSS be developed in fragmented stages, in one department after another, or for the organization as a whole? What is the justification for an organizational approach? The answers to these questions guided the process of our research in defining necessary roles and responsibilities and directed the research accordingly to achieve maximum benefit.

The initiative for most DSS development has come from users. This method may be called an ad-hoc approach. A more practical, but uncommon, strategy is to develop a DSS group within the organization that reports directly to senior management. This group is given the mandate to develop a corporate-wide DSS, establish priorities for applications, and ensure cooperation among users and with the MIS group. When a decision is made to support a particular DSS effort, a task force composed of DSS, MIS, and management specialists is

---

[5] A new approach for viewing DSS functionality developed by El Sawy & El Sherif. They challenge the conventional views of DSS and introduce an "issue based" management method for the design and delivery of I/DSS. The distinctive features of this approach include a focus on issues rather than decisions, a distinction between information support services, prototyping the management of delivery as well as

created to design and implement the system. Such a theoretical foundation was very beneficial in understanding the position of the Cabinet IDSC in serving its users and, more importantly, in interfacing with other related institutions and influence groups. This corporate approach requires senior management involvement and resources in the form of visibility, legitimacy, and funding (Sanders and Courtney, 1985; Meador and Keen, 1984; King and Rodriguez, 1981). The third and final organizational arrangement for DSS is the grouping of it within the information system or data processing department. This approach has the advantage of creating a skilled core group capable of understanding the technology and data resources of the organization. It can coordinate organizational efforts, save resources, and permit the orderly development of DSS tools and report generators. The drawback of this approach is that DSS may never escape the information system department. It may be perceived as a data processing group and may not be able to encourage DSS development in user areas. This approach influenced our research in understanding how the Cabinet IDSC acts as a "think tank" to the Cabinet. The IDSC injected this ability in its well-institutionalized programs by enabling them to be mini-IDSCs to their users.

Finally, by the late 1980s, DSS development efforts to assist individual decision making were extended to groups and entire organizations. During the course of our research, the following leading DSSs were studied to gain familiarization with their usage and functions and to determine their characteristics versus straight MIS functions. We discovered that a considerable number of the major financial / economic DSSs were being used by corporations and not countries and / or governments (Table II-2).

---

design, and a dynamic tracking back-end. (for more details see El Sherif & El Sawy, 1988)

Table II-2

Examples of DSS Systems and Their Use[6]

• American Airlines	Price and route selection
• American Petrofina	Corporate planning and forecasting
• Central and Southwest Corporation	Corporate planning and forecasting
• Champlin Petroleum	Corporate planning and forecasting
• First United Bank Corporation	Investment evaluation
• Frito-Lay, Inc.	Price, advertising, and promotion selection
• General Dynamics	Price evaluation
• Gifford-Hill and Company	Corporate planning and forecasting
• Lear Petroleum	Evaluation of potential drilling sites
• Mercantile Texas Corporation	Corporate planning and forecasting
• National Gypsum	Corporate planning and forecasting
• Southern Railway	Train dispatching and routing
• Texas-New Mexico Power	Corporate planning and forecasting
• Texas Oil and Gas Corporation	Corporate planning and forecasting
• Texas Utilities Company	Corporate planning and forecasting
• The LTV Corporation	Terms of sale of downtown office tower
• The Western Company	Corporate planning and forecasting
• Zale Corporation	Evaluation of potential store sites

2. *External Debt*

After World War II numerous less-developed countries started industrialization programs which contributed to the achievement of rapid sustained growth of income. Although industrialization meant a continuous reduction of the import propensity of their economies, growth also implies that the level of imports tended to exceed that of exports. This gap was covered by external indebtedness.

Unlike national accounts and balance of payments concepts, compilers and analysts have never agreed about external debt. Also,

[6] Jack T. Hogue, 1985.

the different definitions employed by international organizations and other compilers and users of data indicate that no single concept is appropriate for all uses.

The four major concepts adopted when trying to define external debt were originally established and developed by four organizations. They had been involved in the field of debt statistics and data collecting for many years before external debt emerged in the early 1980s as a topic of major international importance in its own right.

These organizations are:

- **The Bank for International Settlements (BIS)** whose members include the world's major central banks involved in debt statistics largely because of the monetary authorities' concern about the commercial banks' involvement in international lending.
- **The International Monetary Fund (IMF)** which is an organization with worldwide membership covering both developed and developing countries. A large part of its task is ensuring the effective operation of the international monetary system and providing financial support and advice to countries with balance of payment difficulties.
- **The Organization for Economic Co-operation and Development (OECD)** which is an organization that is composed of the main market - economy industrial countries whose interest in debt arises from its activities in the field of international financial co-operation especially with developing countries.
- **The World Bank (WB),** with a world-wide membership of both industrial and developing countries. This entity collects and uses debt statistics for operational and analytical purposes related to its function as the main international development organization. It is unique in receiving primary information on the long-term external

debt of developing countries in the form of loan-by-loan data reported by its borrowing members.

According to the WB, a government budget is in-balance when spending equals revenues, in surplus when revenue exceeds spending and in deficit when spending exceeds revenue. Government debt is a result of borrowing. Therefore, the term "debt" implies liability represented by a financial instrument or other formal equivalent.

This research has been very much affected by the WB, IMF, The United Nation Center for Trade and Development (UNCTAD), and others' concepts and definitions of external debt institutions that supply financial and technical assistance to developing countries. It has taken into consideration more detailed concerns, which were presented in a recent paper by UNCTAD staff members[7]. First is the definition of "external debt" itself which has caused numerous problems. Collectively, the Bank for International Settlements (BIS), the (IMF), the (OECD) and the (IBRD) have agreed to a basic and acceptable definition which is as follows:

> "Gross external debt is the amount, at any given time, of disbursed and outstanding contractual liabilities of residents in a country to non-residents to repay principal, with or without interest, or to pay interest, with or without principal"[8].

Second is the time for this definition to be fully implemented and fully institutionalized by indebted countries. Meanwhile, most developing countries have a core of public and publicly guaranteed debt that has, for a long time, been reported every six months to the World Bank and which is mostly of a medium or a long-term nature. This core debt is of concern to the Ministry of Finance of a country because it requires government fiscal resources for debt servicing. It is also of concern to

[7] Debt data are published annually by the World Bank in its World Debt Tables.

[8] IBRD, IMF, BIS and OECD, External Debt, 1988.

the country's central bank because of its claims on foreign exchange earnings. In addition, the central bank must worry about the non-guaranteed external debt of the private sector as well as other liabilities such as remittances of returns on direct foreign investment, leasing contracts, short-term trade credits and interbank lines, etc. A comprehensive management system for external debt must comprise all these components; a complete system for public debt must include domestic debt as well (UNDP 1989).

The World Bank translates this into the following formula:
Total External Debt = public & publicly guaranteed debt + private non-guaranteed debt + use of IMF credit + short term debt.
The primary use of debt statistics is to analyze the debt servicing capacity and to analyze the economic prospects including external financing constraints of a developing country. Certain macroeconomic aggregates are provided in World Bank tables in order to generate what are called "ratios" or "indicators" that should assess the external situation of a developing country. These ratios also offer different measures of the cost of or capacity for, servicing debt in terms of the foreign exchange or output foregone. Some of these macroeconomic aggregates and key debt indicators are defined in Appendix I-A at the end of this thesis.

According to these key indicators, WB classifies indebted countries into four types:

1. Severely indebted low-income countries (SILIC).
2. Severely indebted middle-income countries (SIMIC).
3. Moderately indebted low-income countries (MILIC).
4. Moderately indebted middle-income countries (MIMIC).

This research is centered on the major concepts adopted by the IMF and the World Bank when defining external debt. The reason behind this is that the focal point of our research, i.e., the Egyptian debt management program, followed principals espoused by these two well-known financial institutions, as is the case for a number of developing countries. Egypt's debt management program is highly affected by the operation of the international monetary systems in collecting and using debt statistics for operational and analytical purposes. It is also affected by the role played by institutions such as the World Bank and the IMF in providing financial support and advice to countries in balance of payment difficulties.

3. Debt Management

Neither external debt nor debt management have a clear, accepted definition or a known textbook approach. Debt management functions are usually grouped according to their relationship to the external debt process. Thus the policy, regulatory, accounting and operational functions are all unique to the external debt administration, whereas the other supporting functions are part of the government's general administration (Mehran 1985):

1. Policy: The policy function of external debt management determines national debt policies and strategies in a cooperative effort by all agencies responsible for the economic management of a country. It thus sets sustainable levels of external debt as part of an over-all economic strategy in conjunction with macro-economic planning, particularly as regards financing the budget, the investment program and the balance of payment;
2. Regulatory: The regulatory function sets the rules of the game for the operating units in debt management and limits and coordinates their roles. It must also supervise their work and

correct deviations from the rules. This is achieved through legal and administrative arrangements that ensure the recording and subsequent monitoring of all external debt;

3. Accounting: The accounting function breaks down each loan contract into the debt servicing obligations assumed by the borrower and sets up an effective payment mechanism. In many countries there is need to include in the last two functions' mechanisms for the monitoring project execution as well as the withdrawal and use of loan funds;
4. Operational: The operational function develops plans that accommodates and adopts strategies for the short-and medium-term approach to sources of funds and for the handling of the debt portfolio, particularly for countries that participate in the international financial markets. This is a highly demanding function: in terms of trained staff, equipment for information and calculation, speed of decision-making, etc. Important sub-functions here are :
   - watching and projecting currency and interest movements;
   - following the development and application of new financial instruments including debt conversion techniques;
   - analyzing various options open to a debtor in its search for the least costly forms of borrowing;
   - conducting portfolio management to hedge various risks or further reduce costs; and
   - negotiating loan contracts and other agreements with the lenders.

   Given the additional legal expertise required for loan negotiations and for re-negotiations of debt packages, negotiating may well be regarded as a separate function;

5. Supporting: The supporting functions are resourcing, which supplies the debt management units with staff, consultants, equipment for calculation and information, training opportunities, etc.
6. Auditing : The auditing function tracks operational activities and checks them for accuracy and economy; and
7. Statistical/analytical: The statistical / analytical function keeps all parts of the debt management system abreast of current affairs. Thus it ensures a degree of harmony of views, and provides politicians, the media and the public at large with a basis that forms consensus on how best external debt should be treated.

Viewed in this way, the external debt management operation of a country is normally a highly complex mechanism involving many functions, which are interrelated and interdependent; without good debt data, portfolio management becomes impossible (Mehran 1985). To understand how effective debt management is defined and what appropriate and functional debt management system to use, it was a basic necessity for our research to verify that there is no textbook model for either a prescribed debt management system or organizations that host it or perform the debt management function itself. The following comments by several UNCTAD experts[9] were used as a base during the research process:

> "External debt management and, in particular, the structure (units which perform functions related to debt management), differ from country to country. They are being shaped by historical precedent, constitutional division of responsibility between various tiers of governments, the internal

[9] Presented at the seminar on debt management and financing techniques in collaboration in UNDP regional project RAS/85/015, Pattaya, Thailand, August, 1985.

organization of the government itself, the importance of external debt in overall economic management, the relative importance of particular types of credits within the overall debt structure, and also the regulatory function of external debt management."

"Debt management differs in the degree of control exercised by authorities, the strictness of the regulatory environment, and the nature of the reporting system instituted for external debt operations, which may be mandatory or voluntary, and which may require prior authorization for incurring external obligations or only export reporting. They also differ in their treatment of private sector versus non-financial domestic instruments."

C. The Research

The theoretical foundation for this thesis was a survey of the literature (Decision making and decision support systems; External debt management; and Debt management systems). A number of debt management research aspects that relate to the DM&EM program (Organizational change/dynamics, impact of introducing I/DSS, contextual and cultural problems, etc.), different decision making theories and several practical experiences where studied (such as Mexico and Turkey).

The research covers in depth the establishment of the DM&EM program and records its success, failure and problems faced throughout its different phases. The focus of this research is to assess the impact of using I/DSS in a national context (i.e. debt management) that has different culture and management/organizational behavior (i.e. a developing country). Moreover, the research will be searching for evidence proving whether the DM&EM program improved the debt

management situation in Egypt, especially as regards negotiations with international financial institutions and other creditors, or not. The research investigates the human factor with focus on the DM&EM program staff as the implementors and the decision markers as the users of this technology. It examines our assumption that people receiving proper orientation to a technology (and supported by the proper work environment requirements) can radically change their productivity rates. This research presents interpretations of the actions of key people in this program (i.e., builders, implementors, and users of the DM&EM program). Continuous interaction and brainstorming sessions between the systems' builders, implementors and users had a direct impact on the changes in systems' requirements, design and delivery. In this regard, the research conducted focused more on the changes introduced to the decision making process, the localization of technology and the effects of the use of information technology given the local context. The research method used multiple case studies focusing on the decision making process through-out the introduction and diffusion of information technology in the different debt management agencies concerned, mainly HLEC, CBE and some ministries, and this technology's economic implications. The technical systems used were considered as means to an end.

Finally, the research and empirical work accomplished for this thesis was influenced by the theories and philosophies used and practiced in implementing a number of the medium to large size DSS projects and program in the Egyptian Cabinet IDSC. Also, we have based some findings of our research on the work developed by our colleagues Dr. Hisham El Sherif and Dr. Sherif Kamel who have studied similar programs. Their work in studying the nature of the strategic decision making process, the challenges associated with the process of decision making in turbulent / ill-structured environments and the characteristics

associated with different level decision makers have contributed much to our research.

Research Plan

This research examines the Egyptian DM&EM program with the background of this theoretical perspective. It necessitated covering all the factors, conditions and related aspects affecting the introduction, adaptation, adoption and diffusion of information technology into a developing country like Egypt in order to assess and examine the research proposed hypothesis. It had to cover both political and technical personnel. From the DM&EM program user angle, the research focused mainly on HLEC members and especially the ministers who are directly involved in shaping the debt management policies and the Economic Reform Program. On the technical and implementation side (people involved in the DM&EM development and implementation), we used evidence from three directors, eight developers, and ten loan specialists from the CBE, Ministry of International Cooperation and the Ministry of Finance. Finally, we assessed the human infrastructure, managerial and technical support staff from the Cabinet IDSC.

The research had to take into account all the concerned parties in the different organizations originally involved in the debt management process in Egypt as well as the new group (HLEC) established to take control of this process. The reason behind this was to be able to discuss the DM&EM program with all its dependent and independent factors and to analyze how it has managed to introduce the tools and techniques of information technology to such a diverse community.

Our research focus has been executive level debt management (covering policy, regulatory and resourcing functions) rather than operational level debt management (covering recording, analytical

functions known as passive management and operating, controlling [active management] functions)[10] (UNCTAD, 1988).

The research focuses on the last nine years of DM&EM program implementation and used the approach of case studies and field surveys (Chapters V & VI). After a review of the material, our focus was attracted to the DM&EM program as the main foundation for the rehabilitation of Egypt as a promising emerging economy in the Middle East. Extensive research on the DM&EM's mission, objectives, related goals, beneficiaries, phases, outcome and future plan has been included. We located documentation on the status of debt management before the inception of the program. Ten high-ranking officials were interviewed concerning the functions of the Loans and External Debt Department of the CBE before the program was initiated. In addition, a full study of documentation and an extensive interview of personnel who were involved in the two Paris Club negotiation rounds (1987 / 1991) were conducted.

The fieldwork was conducted over the ten-month period from July 1993 to May 1994.

1. Research Method

We agree with Benbasat (1984), Bonoma (1985), and Yin (1984) that there is no standard definition of a "case study", however it involves at least employing multiple methods of data collection. In our opinion however, the case study approach was not sound research tool for attempting to understand all aspects of the DM&EM Program. Beside factors stated above (P. 22) the following reasons justify our point of view:

- Data needed to be collected by multiple means such as interviews with key political figures and individuals responsible for the DM&EM Program. Questionnaires with the DM&EM program staff and

[10] Explained in more depth in Chapter III.

analysis of the DM&EM Program documents needed also to be used.

- The research highly needs the how and why questions, i.e., questions that demonstrate qualitative performance, achievements and implications and frequency questions that focus on quantitative analysis.
- The research, based on the set of empirical research evidence techniques used, was mainly directed at the exploration, classification and hypothesis development phases of the I/DSS knowledge building process. Moreover, the used approach allowed for both hypothesis development and hypothesis testing.
- The integration of multiple data collection techniques allowed for description, theory building and testing. Consequently, they yielded more general research results and allowed for cross-case analysis.
- The research findings depended heavily on the researcher's ability to integrate various aspects of the research such as the role of the debt management decision maker, his management style, the structure of responsibilities, and the impact of the DM&EM program.
- The used research method offers the advantage of control over time and effort for the researcher to complete the research. Controlling the interview time and the survey questionnaire relevant to each decision-maker was very much dependent on the importance of what variables needed to be tested and findings to be verified and explored.
- The research identified the unit of analysis. Therefore, the researcher examined the research questions to be addressed and considered what generalizations could be drawn from the research findings.

2. Research Plan

The research plan was divided into an exploratory phase and a research phase. In each of these phases, preparatory work, literature

survey, development and conduct of fieldwork, case studies, analysis of findings and the development of generalizations and conclusions were performed. The initial stage was a thorough review of the existing literature in an attempt to link it to the DM&EM program.

The main review of the literature took a period of 11 months during which time extensive research took place covering the fields of debt management; information systems; and decision support systems, operational research and management science. Our sources of research were books, journals, magazines, newspapers, conference papers and proceedings. Because the areas of debt management and information technology are rapidly developing, we focused on the time span 1980 - 1995 in selecting our sources. These sources were located mainly at the libraries of (i) the London School of Economics and Political Science; (ii) the Cabinet IDSC; (iii) the American University in Cairo; (iv) the British Council; (v) the UNCTAD, Cairo; and (vi) the American Cultural Center.

Through the research in debt management, a number of ideas crystallized, thereby affecting the conduct of case studies as well as the analysis of the research findings. Issues related to I/DSS transfer to developing countries with their problems and challenges; adaptation, adoption and diffusion of appropriate technology; strategic decision making process; and management organizational level versus management behavior were best tackled by studying the DM&EM program through the detailed research process conducted.

In the mid-1980's, international monetary and financial institutions, realizing how severe the debt problem was, not only for the debtor countries but for the creditor countries as well, started to offer assistance[11] (financial and technical) to indebted countries to help them overcome debt.

[11] A matrix of suppliers of technical assistance is attached in Appendix III-B.

There were a number of similarities between other debtor countries' experiences and the Egyptian experience (DM&EM program) mainly in the areas of technological infrastructure build-up, information infrastructure build-up, information infrastructure development, and the problems faced in data collection, compilation and processing. However, there were also a number of differences that are highlighted in the research and are relative to the continuous participation of both the HLEC and creditors from one side (as users) and program management from the other side (as builders and implementers). The catalytic role played by the Cabinet IDSC, the continuous upgrading of the training and human resources development programs, and the development of different incentives schemes to improve organizational performance and staff satisfaction was a new dimension not covered by other countries' experiences.

The use of information technology and its impact on an organization are often affected by social and economical constraints (Straub and Wetherbe 1989; Kamel 1994). In Egypt, debt management was a homeless function where debt acquisition was carried out spontaneously by different organizations without any kind of central coordination or even proper debt-acquisition feasibility studies. This research defines information systems as having an effect on the distribution of power by virtue of their impact on information, a vital political source (Waema and Walsham 1990), and in addressing proper roles and responsibilities of the parties involved in the decision making process.

Strategic decision making in developing countries is usually characterized by operating in a turbulent and dynamic environment (El Sherif 1990). As a result, one focus of the research is on the role played by the DM&EM program in adapting to possible changes in user requirements as well as changes occurring in the technology. This

relates to how flexible systems were built with changeable software applications, portability of the system across different platforms, and flexibility in the design allowing possible expansion in scope and components both vertically and horizontally. The research will show how the DM&EM program accommodated the changes that occurred since its early development phases in terms of information systems by forecasting the horizon through proper planning and design (Land 1982; Kamel 1994). It will also demonstrate how the build-up of robust DM&EM sub-programs has helped the program adapt to the changing circumstances in the environment and changing needs of the users.

The development and implementation of the DM&EM program was studied in light of a development strategy that prototypes the implementation processes as part of the design and delivery of the system (Alavi 1984). Also, empirical research shows that when prototyping and interactive design are used in building I/DSS, user satisfaction, attitudes and perceptions are more favorable (Benbasat and Nault 1990). The research has shown that continuous interaction between the roles in decision support systems that include the user, his assistant, the system builder and the technical supporter have had positive impacts on their design and use (Sprague 1980). As a result, the research shows how the initiation phases of the DM&EM program, started in the Cabinet IDSC and later developed in the CBE, represented the pilot phase. Later experiences, accumulated during implementation, affected subsequent phases of the program in terms of more appropriate addressing and satisfaction for user needs.

The DM&EM program I/DSS-based network, coupled with major strategic economic issues, creates opportunities among various debt management responsible institutions to effectively contribute in the base building of the entire Egyptian economic reform program.

Following the same philosophy in design, delivery and implementation of various I/DSS projects and programs, it was important to review the existing documentation on the experience of the Cabinet IDSC. The IDSC introduced some major informatics projects in various fields addressing different socio-economic aspects in Egypt. The review started in 1992 and continued through 1994 with a continuous track on new developments of new projects. The general review was followed by a focused study of the different aspects of the DM&EM program.

The research was meant to test the hypothesis: The impact of I/DSS in debt management – the Egyptian experience. Further, it has compared them with the results of the practices of the various DM&EM program functions and impact areas. The second stage focused on conducting some field work through covering the different phases of the DM&EM program as well as its users and builders. The support of the Cabinet IDSC management was very important for successfully completing such field work.

The analysis of the research findings lasted for a period of 10 months (May 1994 to March 1995). It included issues related to DM&EM program planning versus implementation such as:

- Political and economic problems faced;
- Changes in roles and responsibilities;
- Re-definition of processes and procedures;
- Challenges of resistance to change;
- I/DSS design, implementation and institutionalization challenges; and
- Technical infrastructure build-up with all its financial and administrative requirements.

The next stage following directly from analysis of the research findings was arriving at generalizations and conclusions based on the research findings; to articulate the research contribution in the domain of I/DSS;

and to identify future research opportunities in the development and implementation of I/DSS in different organizational settings.

3. Conduct of the Research

Our research methodology mainly depended on multiple cases studies addressing different levels of decision makers (i.e., strategic, tactical, and operational) covering multi-dimensional aspects and interests (program users and builders at different levels) in order to extensively study the experience of the DM&EM program. The research investigated I/DSS introduction and implementation and the crucial need for the introduction of radical economic reform. Coupled with that, it has also studied the introduction of the debt management function.

Both aspects of I/DSS and debt management have had mutual effects on the implementation of the DM&EM program. In other words, the main aspects covered by the research included the role of the DM&EM program in utilizing I/DSS in economic development reform and planning at the country level and its implications on the design and delivery process of I/DSS in such areas.

Furthermore, the research studied a number of information system research aspects that relate to project planning and implementation, organizational dynamics and I/DSS design, build-up, implementation, and delivery in developing economies.

The field research lasted from July, 1993 until May, 1994. Separately, a number of field studies, sometimes at the same institution or with the interviewee) were conducted throughout 1994 and 1995. The reasons behind this were to inquire about and/or clarify a specific aspect or to focus more on specific issues and changes that had occurred throughout the phases of the program. Testing of these changes on DM&EM program performance took on an important role during this phase.

The research method used combined both qualitative and quantitative techniques (Duchon and Kaplan 1988) to introduce both testability and context into the research (Maxwell, et al 1986). Different kinds of data were collected by different methods such as interviews[12], observations, surveys[13] and extrapolation from different documentation available. The data was collected from different sources such as the Cabinet, CBE, different ministries and international sources.

As discussed above, the aim of the field research was to examine the strategic level of debt management decision-makers (the users); their assistants (the supporters); and the DM&EM program management (the builders). Ten people were interviewed: the Prime Minister; the Deputy Prime Minister and Governor of the CBE; three Ministers; the DM&EM program Director at the CBE; the DM&EM National Program Director at the IDSC; the IDSC Executive Manager; and the IDSC DSS Department Director.

The interviews (see Appendix II-A) targeted individuals at various levels as well as the different functions (i.e., the users, supporters, and the builders). The essence of the interviews was to absorb as wide a range of qualitative information, viewpoints and comments as we could. The survey questionnaire the four point Lickert scale exhibited in Appendix II-B, was presented to most of our targeted groups in trying to complement our research quantitatively.

Addressing different management levels and functions necessitated that we develop more than one set of interview questions and different questionnaires. The questions for both the interviews and the questionnaire were revised more than one once to allow the interviewees to express their views freely and honestly by selecting from multiple answers.

---

[12] A mix of open-ended, semi-structured and structured interviews to best fit the requirement of the research and the different nature of the interviewees.

Both the interviews and the questionnaire were meant to test different qualitative and quantitative aspects. Issues such as: How should the impact of the DM&EM program be measured?; How and / or to what extent did the DM&EM program make a difference in the decision making capabilities of top policy and decision makers in Egypt?; To what degree did the DM&EM program meet its stated mission, objectives, and level of satisfaction for its targeted users?; What are the critical factors that led to the success of the DM&EM program?; and What future plans and activities are expected to be carried out by the DM&EM program?

The observations and remarks made and conclusions drawn were based on continuous interaction with DM&EM program users and management time well spent for the purposes of research. However, a number of difficulties and challenges were encountered in trying to schedule appointments with high ranking officials; meetings were delayed, postponed or even canceled. Very short periods of time were allowed for us to grasp what was being said and fulfill the requirement of the interview. Follow-up on promised documents and / or needed clarifications was not easy. The building of trust with all member of this focus group was very important due to the sensitivity of the subject.[14]

Extrapolation from the DM&EM program documents was done to identify the literature available and to analyze the issues related to the challenges and opportunities of I/DSS implementation. This was compared with the varying roles and management style of the decision-makers, structure of responsibility and DM&EM program

---

[13] Surveys were developed to analyze comments and views of different interviewees.

[14] The position that we have ourselves in, documenting the successful Egyptian experience in debt management and assisting in defining the future of the DM&EM program, was very helpful in building this trust. It is worth mentioning also that, being a senior member of the Cabinet IDSC and a familiar face to many of the interviewees helped immensely. Much credit should be given to IDSC top management in helping us in this process.

deliverables. Moreover, the selection criteria for these extrapolations considered the provision of cases from various sectors in the economy. Case studies were meant to support understanding the process under research and demonstrating casual effects within a natural setting through the ability to provide a large amount of data. The goals of the researcher and the nature of the research topic influenced the selection of the research strategy.

D. Conclusion

Our work for this thesis is meant to address the origins and unconventional aspects of I/DSS research in supporting national level economic development. It aims at providing a scholarly view on its findings on both I/DSS and debt management institution development. It is our intention that this research and its findings be useful to scholars, researcher and practitioners studying similar chronic problems and / or implementing comparable national programs. This research was meant to provide a process for symptoms identification, ways to go about implementation, expected implications and benefits of a program similar to DM&EM.

At the I/DSS debt management theoretical level, the research reflects how I/DSS capabilities could be used in supporting top policy and decision making at the country level; I/DSS has many implications for socio-economic and development planning as well. At the practical level, the research allows practitioners of I/DSS (i.e., users, supporters and builders) large informatics programs, to study the implications of introducing I/DSS at the national level in developing economies.

The research has covered a considerable number of multi-level (i.e., strategic, tactical, and operational) and multi-function (i.e., top policy and decision makers, ministers, technical and financial) groups who have been either users, influencers, builders or watchers of the DM&EM

program throughout the last nine years. It is meant to provide an in-depth study of the problem, its reasons and causes, and how to deal with it, in addition to other countries' experiences in dealing with similar situations. Moreover, the research is aimed at a review of most of the debt management practices applied and the debt management systems used to include the advantages and disadvantages of each. Our focus is on how the DM&EM program has made use of numerous world-wide experiences in formulating its mandate and executing its plans in order to help improve the decision making process and radically tackle a chronic and severe problem.

CHAPTER III
Theoretical Background

Decision Making, Decision Support Systems and Debt Management

A. Decision Making

1. Introduction

Decision making theory refers to different levels, types and stages of decision making. The process itself is different at the individual and organizational decision making levels which in turn involves a number of different models. As mentioned before, levels of institutional decision making are divided into three types: strategic, management control (tactical), and operational control.

In less-developed management practices, decision making is merely a struggle between a decision maker's position and his management behavior. Questions such as: Does this really affect the sharpness and efficiency of making the right decision at the right time? Do decision-makers have a clear perception of the metaphor strategic, tactical and operations management levels? Do they perceive any inter-relatedness and effects of one layer on another? Do they believe that people belonging to one management layer perform functions in other layers or not? Many question such as these un-answered for researchers to explore and draw the proper model to frame them.

The decision-making process depends on a topology of human problem solving. Decisions are classified by being either programmed or non-programmed (El Sherif and El Sawy, 1988). Elsewhere in the literature, these decisions are referred to as structured and unstructured; we will use the latter forms here. Most of the time the former type of decision making (i.e., unstructured) is more difficult to perform, needs high management intellectuality, and requires more of decision makers' creativity. The unstructured decision making process is

usually more complex but we do not know if it requires different types or more complex decision support tools.

2. Organizational Models of Decision Making

When focusing on organizational models of decision making, it is useful to think of them in relation to rational individual decision making. Organizations can be thought of as having singular goals, controlled by unitary rational decision makers who are completely informed, who choose among alternatives after weighing the consequences, and who act to maximize the goals of the organization. Any large organization is composed of a number of specialized subgroups (i.e. Marketing, Finance, Administration, ..etc.) that are loosely coordinated, but each with a substantial life and capability of its own. The performance of such subgroups affects to a great extent the performance of the organization as a whole.

Organizations are also composed of a number of leaders who compete with each other for leadership. To a large extent, what the organization ultimately decides to do will be the result of political competition among its leaders and staff. Each of these perspectives reflects a different organizational model of decision making (Table III-1) that is very different from the individual models previously described.

TABLE III-1[1]

Models of Organizational Choice

Name	Basic Concept	Inference Pattern
Rational Actor	Comprehensive rationality	Organizations select goals(s), examine all alternatives and consequences and then choose a policy that maximizes the goals or preference function.
Bureaucratic	Organizational output	Goals are determined by resource standard operating constraints and existing human and procedures capital resources; SOPs are combined into programs, programs into repertoires which determine what policies will be chosen. The primary purpose of the organization is to survive; uncertainty reduction is the principal goal. Policies are chosen that are incrementally different from the past.
Political	Political outcome	Organizational decisions result from political competition, key players are involved in a game of influence, bargaining, and power. Organizational outcomes are determined by the beliefs and goals of players, their skills in playing the game, the resources they bring to bear, and the limits on their attention and power.

[1] Laudon, 1974; and Laudon, 1986 on which our analysis is based.

Name	Basic Concept	Inference Pattern
Garbage Can	Non adaptive organizational	Most organizations are program non-adaptive, temporary, and disappear over time. Organizational decisions result from interactions among streams of problems, potential actions, participants, and chance.

a. Bureaucratic models

The bureaucratic model of organizations is based on standard operating procedures (SOPs). Actions performed by an organization are an output of one or several organizational sub-units (e.g., marketing, production, finance, and personnel). Problems facing any organization are usually too massive and too complex to the extent that they cannot be attended to by the organization as a whole. Therefore, problems are instead divided into components and packaged to specialized groups. Each organizational sub-unit has a number of standard operating procedures. These tried and proven techniques are invoked when dealing with a problem. Changing these standard operating procedures is rare, involves changes in personnel, and is risky (what is the guarantee that new techniques work better than the old ones?)

Although senior management and leaders are hired to coordinate and lead the organization, local sub-units that feed information upward and provide standard solutions effectively trap them. Senior management cannot decide to act in ways that the major sub-units cannot support. Organizational change requires a long time and is usually a result of learning new ways of behaving.

b. Political models

Power is concentrated in the hands of a few people at the top of the organization. For a variety of reasons, the opinions of these leaders differ on what the organization should do. Viewpoint competition ensures that each individual in an organization, especially at the top, is a key player in the game of politics. In this respect, what an organization does is a result of political bargains struck among key leaders.

In other words, the organization's actions are not necessarily rational and the outcome is not what any individual necessarily wanted. Instead, policy-organizational action is a compromise, a mixture of conflicting tendencies. This form of organizations does not come up with "solutions" to solve "problems". They rather come up with compromises that reflect the conflicts, the major stake holders, the diverse interests, unequal power, and confusion that constitute politics. Decision-makers in this model are characterized by limited attention spans; participation in tens (sometimes hundreds) of games and issues; and susceptibility to mis-perception, extraneous influences, miscommunication, and pressures of impending deadlines. Players in the game focus almost entirely on the short-term problem: What decision must be made today? Long-term strategic thinking for the whole organization is almost forgotten as individual decision makers focus on their short-term interests and on the part of the problem they are interested in (Laudon, 1974; and Laudon, 1986).

c. Garbage Can Models

The preceding organizational models choose their starting point as the basic notion that "organizations try to adapt, successfully, to changing environmental conditions. Presumably, over the long run, organizations develop new programs and actions in order to meet their goals of profit, survival, and so on. When severely challenged by a changing

environment, a number of organizations prove to be non-adaptive, incapable of learning, and unchanging" (Lockett, 1989).

Decision making theory states that organizations are not rational, decision making is largely accidental and is a product of a stream of solutions, problems, and situations that are randomly associated. That is, solutions become attached to problems for accidental reasons. If this model is true, it should not be surprising that the wrong solutions are applied to the wrong problems in an organization and that, over time, a large number of organizations make critical mistakes that lead to their dissolution.

In conclusion, while there are many different types of organizational models of decision making, an organization's success is mainly dependent on the optimum choice of its management style. Depending on the organization's nature, type of work, degree of automation, style of management adopted and many other factors, the rational, political, bureaucratic, garbage can, or any one of a number of well-know models can be selected. Though success criteria are easily identified, the question that remains open for researchers is how managers can practically settle on the best organizational model for decision making.

Decision making is only one of numerous management activities. It is one of the areas that information systems (IS) have sought most of all to affect (with mixed success). In the following section we will touch upon some advanced forms of IS, namely DSS, that tackle how systems can support the decision making process.

B. Decision Support Systems

1. Introduction

In the early 1970s, a number of institutions began using information systems that were quite different from traditional MIS. These new systems were smaller (in terms of labor and cost). They were also interactive, designed to help end users utilize data and models in order to discuss and make decisions concerning (not solve) semi-structured and unstructured problems (Keen, 1976; Henderson and Schilling, 1985). By the late 1980s, these early efforts to assist individual decision making were extended to groups and entire organizations.

2. Definition of DSS

The common definition of DSS is derived from its characteristics. It is an interactive system under user control, providing data and models as a basis for discussing and making decisions concerning semi-structured and unstructured problems.

Early examples of DSS are Getty Oil's Plan Analysis and Modeling System (PAMS) and the American Airlines' Analytical Information Management System (AAIMS), built in the late 1970s. Both of these systems allowed managers to interrogate corporate and industry databases directly and permitted analysis of the data with financial, statistical, and other analytic models. In Chapter II, Table II-2, we listed some of examples of already known DSSs and their use in supporting well-known corporate decisions.

3. Origins of DSS

It is difficult to understand the significance of DSS without considering where it fits into the evolution of information technology and architecture in organizations. It is considered to be a natural evolution that began with Electronic Data Processing (EDP) and the first

transaction processing system and evolved in the late 1960s with MIS and the first management reporting systems.

Yet, by the 1970s, dissatisfaction with MIS was emerging in the end-user community. The ability of MIS to support decision-making directly was limited. MIS systems were not interactive and required intervention by analysts and designers just to get information. Project development took too long to permit the use of relevant information in day-to-day decision making. Rather than supporting management decision making directly, MIS systems were often nothing more than report generators (Keen, 1976; Keen and Morton, 1982).

Moreover, advances in technology by the mid-1970s had made different kinds of systems possible. With minicomputers, processing power could be distributed to users (as opposed to being centralized in the data processing department). Operating systems permitted interactive, time-shared sessions. More user-friendly software was being developed, especially report generators and statistical packages. The first databases and fourth-generation languages were created in this period. Equally important was the development of powerful graphics software and hardware that could display choices and alternatives to a large number of users (Keen, 1976; Keen and Morton, 1982).

With the emergence of microcomputers in the 1980s and desktop workstations in the late 1980s, early ideas for DSS could finally be realized. With the new information architecture, it was at least technically possible to provide end users with access to very large databases, analytic models, and user-friendly interfaces. In addition, the technical possibility now existed to provide decision support to groups and entire organizations. These technical advances revolutionized end-user expectations. Batch reports, put out by MIS departments, simply could not match the appeal of interactive

terminals under user control analyzing corporate data with the aid of powerful statistical models.

Aside from technical advances, there was, during this period, an active reconsideration of decision making in organizations. There was a growing awareness that decisions faced by ordinary managers would never be responsive to operations research techniques. Simply put, formal mathematical models did not fit a wide variety of management decisions and could not be extended to group or organizational decision making. Yet there was also the belief that systematic use of information technology could make an important contribution to decisions under conditions of uncertainty.

DSS often had a different organizational position than MIS. Most large MIS groups were unable or unwilling to respond to the growing interest in and demand for DSS by end users. DSS groups often sprang up as separate entities in end-user divisions or as a central corporate DSS group operating under central headquarters staff control. As Keen has noted, DSS started as a fringe group opposed by data processing departments (Keen and Morton, 1982; Hogue, 1985).

4. Characteristics of DSS

With the understanding of the components and the philosophy behind DSS, it is possible to discuss more precisely what is meant by decision support. Because DSS promises to support decision making, it is important to understand the unique characteristics of DSS that support this claim.

DSS are designed to support semi-structured and unstructured problem analysis. To differentiate between them, structured problems are repetitive and routine, for which known algorithms provide solutions. Unstructured problems are novel and non-routine, for which there is no algorithm for solution. One can discuss and make decisions concerning

unstructured problems, but they are not solved in the sense of finding an answer to an equation (Henderrson and Schilling, 1985). Semi-structured problems fall between structured and unstructured problems. Along with other characteristics to be discussed, DSS were designed to support important decisions often made by senior executives (Keen, 1976; Keen and Morton, 1982).

The Simon's description of the decision making process, which consists of four stages -- intelligence, design, choice, and implementation -- (discussed in detail in Chapter II) is most widely used. Traditionally, (EDP) and MIS have provided managers with intelligence (information) on day-to-day operations. Management science and operations research (MS/OR) have also provided management with models for making choices. DSS was designed to incorporate the data of MIS/EDP and the models of MS/OR. DSS was intended to help design alternatives and monitor the adoption or implementation process.

5. Types of DSS

The two typologies of decision making, one based on levels in the organization and the other on the nature of human problem solving, have been combined to form a decision support typology, as illustrated in Figure III-1 (Gorry and Scott-Morton, 1971). In general, operational control personnel deal with fairly well-structured problems. In contrast, strategic planners deal with highly unstructured problems. Nevertheless, each level of the organization contains both structured and unstructured problems.

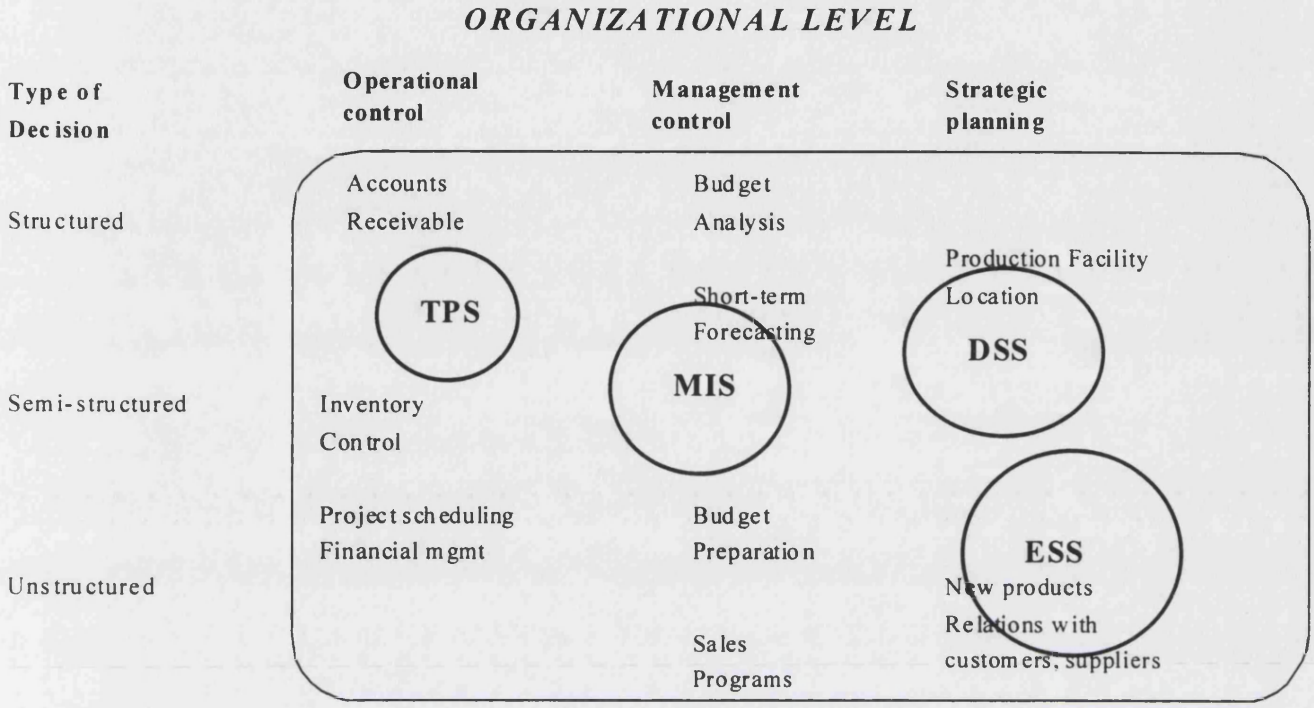


Figure III-1

Computer Based IS Support of Different Types of Decisions

Key: TPS = transaction processing system.
MIS = management information system.
DSS = decision support system.
ESS = executive support system.

In the past, most of the success in modern information systems came from dealing with structured, operational, and management control decisions. But now most of the exciting applications occur in the management, knowledge and strategic planning areas, where problems are either semi-structured or are totally unstructured. Examples include general DSS; microcomputer-based decision-making

systems such as Lotus 1-2-3, MicroSoft Excel and other packages; professional workstations; and general planning and simulation systems. There exist a number of different types of DSS that have emerged based on the evolution and advances of different technologies and usage. Our research will focus on four DSS classifications namely: Data versus model-oriented DSS; Issue based DSS; DSS generators versus specific DSS; and individual, group, and organizational DSS. Table III-2 describes the principle kinds of DSS found by researchers. These four types of DSS are described more fully below.

a. Data versus model-oriented DSS

Clearly, some DSS systems are more data-oriented than others. This is particularly true of DSS that migrate out of MIS areas. Others DSS are more model-oriented, often forgetting completely how data enter the system. At the extreme, DSS consisting of only data or only models are not true DSS at all. The concept of DSS requires that data and models be integral parts of the system.

b. Issue based DSS

El Sherif and El Sawy have introduced a new approach for managing the design and delivery of information and decision support systems for strategic decision making. It draws on experiences gained from implementing systems and services for enhancing the strategic decision making process of the Egyptian Cabinet. Their approach challenges the conventional views of conceptualizing decision support systems and methods for managing them. It introduces an "issue-based" management method for the design and delivery processes. The distinctive features of this approach includes :

- A focus on issues rather than decisions;

- A distinction between information support services and decision support services;
- Prototyping the management of delivery as well as design; and
- Dynamic tracking for back-end issues.

Comparing conventional and issue-based DSS approaches suggests that the later can be an effective stepping stone for the design and delivery of executive information systems (EIS) in special context by providing DSSs that are "EIS-ready".

c. DSS generators versus specific DSS

A second important distinction can be made between DSS generators and specific DSS. An example of a DSS generator is Lotus 1-2-3 or any of the sophisticated personal computer (PC) spreadsheet packages. DSS generators are collections of tools that permit the development of a number of specific DSS. Specific DSS are systems devoted to the analysis of a particular set of problems (e.g., marketing, production, and inventory).

d. Individual, group, and organizational DSS

The early work in DSS focused largely on supporting individual decision making. Because so much work is accomplished in groups within organizations, during the late 1980s most developers and scholars began to focus on how computers could support group and organizational decision making. This work followed even earlier efforts to develop electronic aids to community and societal decision making in the 1970s, based largely on mainframes (Laudon, 1977).

The baseline definition of a Group Decision Support System (GDSS) is "an interactive computer-based system to facilitate the solution of unstructured problems by a set of decision makers working together as a group" (DeSanctis and Gallupe, 1985).

Table III-2
Different Types of DSS

• Alter (1980)	• Data-oriented versus model-oriented
• Canning (1982)	• Reporting versus decision analysis
• Donovan and Madnick (1977)	• Ad hoc versus institutional; one-time versus recurring problems
• Sprague and Carlson (1982)	• Specific DSS versus DSS generators
• Bonczek et al, (1981)	• Procedural versus non procedural
• King (1983)	• Very large versus small
• Henderson and Schilling (1985)	• Public versus private
• Kraemer and King (1988)	• Individual versus group
• Laudon (1977)	• Organizational and societal
• El-Sherif and El-Sawy (1988)	• Issue based versus decision oriented

6. Factors in DSS Success and Failure

As experience with DSS has grown, a number of factors have been identified as important to their success or failure. The success factors are not very different from those of MIS and other systems. Studies of DSS applications in different institutions shows that user training, top management's support, length of use, and novelty of the application were the most important factors in DSS success. Success is defined as perceived improvements in decision making and overall satisfaction with the DSS (Sanders and Courtney, 1985).

A study of thirty-four DSS found that a top management orientation of the DSS (helping to make important decisions) and return on investment are the most important factors in the approval process for DSS (Meador and Keen, 1984; King, 1981). This is an important finding because it highlights what organizations are looking for when they develop DSS. Organizations need support for senior management decision making, which requires custom-built, flexible, and easy-to-use systems that address important organizational problems.

In most of the literature, DSS covers support decision making on the corporate / institutional level while carrying out their specific management functions (finance, marketing, resourcing, etc.); however, what our research is concerned the applicability of using DSS in national context and can DSS support large scale national problems such as debt management? Was DSS really used? What were the results or how successful was the DSS program?. In other words, we have seen and studied "organizational (corporate)" DSS but, is there "country" DSS with all its characteristics in terms of size, nature of problem supported, resources required, setup needed and so forth.

Appendix III-A presents additional background material on both decision making and DSS.

C. Debt Management

1. Introduction

Excessive foreign debt was a major obstacle to economic growth and development for many developing countries throughout most of the 1980's. After World War II, domestic savings were insufficient to support a given level of investment, so a current account deficit occurred in most developing countries in which foreign borrowing was the right solution at that time to supplement the domestic savings rate.

If foreign savings (borrowing) had not been used, the rate of investment would have fallen to the level accommodated by domestic savings, with a consequent fall in the rate of growth of the economy. So, the growth process for developing economics was naturally and inevitably associated with foreign indebtedness. In sum, it was a growth-cum-debt approach to development.

With the attitude that borrowing for development was a good thing, government agencies organized themselves essentially to maximize the amount of loan funds they could attract from abroad. Responsibility for obtaining, negotiating and utilizing loan funds was dispersed among ministries and agencies like the Ministry of Finance and the Central Bank. Another factor that contributed, in a way, to the aggravation of the external debt crisis was the mis-management of the debt itself and of the local economy by the governments of certain developing countries. The failure to make productive use of external loans reflected a number of issues such as corruption, diversion of foreign exchange to capital flights and over expenditure on arms. There was also major expenditure on grand schemes and a failure to devote resources to sound development policies.

The debt crisis forced a change of attitude among less developed countries (LDC) governments. Most developing countries now wish they had less debt, not more. Instead of ministries and developing agencies doing their best to raise loan funds, governments now want tight central control.

For a developing country to be able to deal successfully with its debt, it requires two main resources: (i)an adequate source of funds for servicing the debt; and (ii)a well-organized, timely supply of information, which enables proper development and implementation of necessary policies. Additionally, it needs to structure and administer its debt portfolio effectively.

2. What is Debt?

The term "debt" implies liability represented by a financial instrument or other formal equivalent. Total external debt is defined as the amount, at any given time, of disbursed and outstanding contractual liabilities of residents of a country to non-residents to repay principal, with or without interest, or to pay interest with or without principal (IBRD, IMF, BIS and OECD, 1988).

With a management purpose in mind, a commonly used narrow definition of external debt includes all medium-term and long-term debt (for one year or more) owed by, or guaranteed by, the public sector to nonresidents. In principle, all private external debt guaranteed by the government or other public institutions should be considered as public, since it will be subject to the same regulations and procedures as debt owed directly by the public sector. In addition, such debt is a contingent obligation of the government. Public debt should also include liabilities of the central bank, government agencies, local governments, and so on.

A broader definition adds short-term public sector debt and/or private sector (non-guaranteed) debt (both short-term and long-term). Definitions become complicated because the distinction between different types of external resources such as loans, grants, and direct investment is not always obvious.

A country's failure in knowing its foreign-currency debt may lead it to underestimating its foreign exchange problems and to formulating a debt-rescheduling strategy which is inappropriate to the circumstances the country is experiencing. Forward planning depends on the country's knowledge of its foreign currency debt. It is impossible for a country to construct a foreign exchange budget and to determine a debt-rescheduling strategy if the extent of its foreign-currency debt is

unknown. In this context, it is not sufficient to know only the direct foreign debt of the government; the foreign currency debt incurred by the Central Bank and other organizations must also be known.

Private sector foreign currency debt is also important. Every debtor country should provide full economic information to its creditors, whether commercial or non-commercial. The information should include its current external-payment problems, the steps being taken to meet these problems, its economic prospects, its requirements for debt relief and the way in which the refinanced loans will be repaid. Creditors always want to know how they are going to get their money back. Although information on debt service obligations is a critical component of the capacity to repay, banks routinely lend to countries without adequate data on external debt. It is possible, for example, that Mexico might not have been permitted to become so over extended if individual banks had been aware of the amounts their competitors were lending, particularly during the six months before August 1982 crisis when Mexico borrowed US$ 7 billion.

Similarly, information on international reserves, the balance of payment and domestic economic activity is available only after a substantial lag, although such information is essential to evaluating and appraising the effectiveness of a country's economic management. In the absence of reliable data and objective procedures for estimating the probability of country default, banks appeared to evaluate the borrowing capacity by comparing their exposure with those of other countries.

In 1990 a team of experts from the IMF conducted a survey[2] and found that in a number of countries debt strategy is not sufficiently integrated into the macro-economic context. The reason is partly because debt

data are still incomplete or inadequately organized, but there are also deficiencies in the machinery available to the government for the formulation and implementation of a coherent policy. This often hinders the government in its dialogue with international agencies such as the IMF and World Bank as both institutions tend to have strong views on policies that the country should pursue with the Paris and London Clubs of Lenders. In some cases, the main problem seems to be a lack of appropriate direction from authorities to ensure that debt management is given priority in the country's policies.

Therefore, improving the management of external debt has become an increasingly important objective of developing countries. Central to this task is the provision of timely, accurate and detailed data on external debt outstanding and on debt-service payments falling due. Among other things, the absence of such data hinders the formulation and implementation of economic policy, leads to inefficient management of foreign exchange reserves, and increases the cost of borrowing in various ways.

3. Concept of Debt Management and Its Evolution

Debt management has two dimensions: the macro-economic and the institutional administrative. In the former, debt management must be seen as an integral part of a country's overall macro-economic management; in its institutional administrative dimension, it is part of a broader process of public administration and management (Ebeid, 1993).

As far as external debt is concerned, a government's immediate interest is, of course, its own external liabilities, which affect both the

---

[2] Proceedings of a seminar on external debt management, jointly organized by the Islamic Research & Training Institute of the Islamic Development Bank, Jeddah, Saudi Arabia and the World Bank, Washington D.C., USA, Jeddah, May 12 - 16, 1990.

budget and foreign exchange reserves. Government responsibility for foreign exchange reserves and regulations may also imply responsibility for providing foreign exchange to meet private sector debt and, eventually, the distribution of profit from direct foreign investment.

To conclude, any system of debt management must allow successful management of public and publicly guaranteed external debt (mostly of a medium-term and long-term nature). Such a system can also be extended in both of the two following directions:

1. To include private sector non-guaranteed debt or other external debt of the country, as deemed necessary from the foreign exchange point of view.
2. To include public domestic debt, as deemed necessary, from the public finance point of view.

4. Debt Management Functions

Effective debt management primarily involves seven basic functions: policy, regulatory, resourcing, recording, analytical, controlling and operating functions. The first three functions are part of what can be called "executive debt management". The other four functions may be considered as part of "operational debt management" (Hassanali, 1985).

- **Executive debt management** might be viewed as the establishment of the "rules of the game" by the highest levels of government which gives direction and organization to the whole and might be called the debt management system.
- **Operational debt management** is the day-to-day management of debt in accordance with executive direction and organization. Operational debt management may in turn be viewed as being composed of passive and active debt management (Hassanali,

1985). Although the dividing line is not always clear, the former is meant to involve functions which do not include actions (interactions and transactions) on the debt front, while the latter does. Passive management very much influences active management through the provision of information and analysis and is as important.

Each function of effective debt management has a major product or output, as shown in Table III-3.

Table III-3

Debt Management Functions and Output

Executive Debt Management	**Direction and Organizations**
Policy Function	Strategy
Regulatory Function	Structure
Resourcing Function	Staffing and means
Operational Debt Management	**Debt Dynamics and Practice**
Passive Management	
Recording Function	Information
Analytical Function	Analysis
Active Management	
Operating Function	Operations
Controlling Functions	Control, coordination, and monitoring

The above debt management functions are thoroughly explained in Appendix III-B.

5. Debt Management System (DMS)

An external debt management system of any country is normally a highly complex mechanism involving a number of interrelated and inter-dependent functions. Without good debt data, portfolio management becomes impossible. Legal instruments and administrative systems must allow the operational function to make quick decisions if the monitoring system is to be of any use.

Various functions of debt management are usually performed by a number of government agencies and institutions as well as private sector companies. The danger of uncoordinated overlapping is very great, particularly if the system is decentralized to several ministries, a

President or Prime Minister's office, the Central Bank and a host of institutional borrowers.

A debt management system, to be effective, should be driven and controlled by a "policy unit". Such a unit is the highest authority on all matters and should embrace top level people in the government of Egypt i.e. the Ministers of Finance, Planning and the Governor of the Central Bank. An effective policy unit of this kind is almost always a formal committee of the government which meets regularly to formulate and follow-up on strategic, regulatory and resource features of the system.

Effective debt-management also entails developing and maintaining cooperation between the units and agencies involved. For a macro-economist to be capable of responding to external debt management inquiries, he needs to focus on: (i) following economic developments in major capital markets, particularly regarding to interest and exchange rates; and (ii) presenting the country's economy and its state of borrowing to the international financial community. The office also needs market officers who follow events, in particular, financial markets, on a regular basis and keep track of technical innovations. Most of these functions are highly specialized and can be properly carried out only by qualified staff who must be on the same level as personnel of major international banks.

6. DMS Principal Functions and Outputs

a. Principal functions

A DMS should be designed to fulfill the operational, statistical and analytical needs of a wide variety of users within government with responsibilities for different aspects of debt management and external

financial planning. Broadly speaking, its principal functions should be the following:

- Registration
- Monitoring
- Analysis

Under the heading of registration, the system provides for the capture of information on the financial provisions of loan and grant agreements, on the characteristics of the different parties or beneficiaries to the agreements, the utilization of the proceeds, and the relation of each agreement to the other agreements (Husain, 1989). Much of this information is printed on a registration certificate which is system retained in permanent files as a record that the agreement has been registered in the system.

The DMS should also provide for monitoring and financial control. Its loan ledger module should include data on individual loan transactions in sufficient detail and with sufficient accuracy to permit the user to eliminate the manual posting of transactions to ledger accounts. It should posses the facility for projecting debt-service payments by currency and by due dates within any given time frame. This would assist central banks in more efficient foreign exchange management and in avoiding penalty interest charges for overdue payments.

By combining the data in the loan ledger module with debt-service schedules projected from data in the loan registration module, debt-service payments possibly in arrears would be automatically brought to the attention of management for action.

The DMS should be designed to support both macro-economic sensitivity analysis and statistical analysis of the existing debt stock. A subsystem of DMS should be dedicated to "debt projections", which could be used for macro-economic analysis. This subsystem would

combine debt statistics, compiled into categories from data on individual loans. This subsystem would then be used for identifying gross borrowing requirements, developing a policy in respect of external borrowing, and assessing the likelihood of having to give serious consideration to debt rescheduling.

Statistical analysis should be facilitated by a flexible report preparation program, which permits the user to select (Valantin, 1989):

1. The type of report (cumulative transactions and loan balances, or debt-service projections);
2. The subset of variables from a large number of possible variables to be included in tables;
3. The report period (day, month, quarter or year for at least 40 periods);
4. The subset of loans to be included in the report selected by specifying a combination of characteristics or individual loan numbers; and,
5. A scheme for aggregation.

b. System Outputs

Outputs

In addition to the reports prepared by the flexible report preparation program and the projections of balance-of-payments and debt-service data provided by the debt projection system (DPS), the system should be able to produce pre-programmed reports which can be grouped as follows: registration reports, accounting reports, user-requested reports and reference file reports (UNCTAD, 1988). The system should be able also to provide a browsing facility for reviewing data directly on the computer screen.

Automatic calculations

One important feature of the DMS is automatic calculations. It relieves the user of the burden of calculating debt-service schedules and average terms for groups of loans. These types of calculations are fundamental for cash flow management and for establishing guidelines on terms for new borrowing. For analytical purposes, the DMS should calculate a number of characteristics (discussed in detail in Chapter V) of the entire loan stock, groups of loans, or individual loans (when appropriate).

D. Conclusion

As we have seen in the selected literature review above, the issue of debt management is dependent on the optimum combination of well-balanced debt management functions in addition to a well-defined debt management system. However, a number of questions remain unanswered, such as:

- Effective debt management encompasses such issues as administration; operation of an office; communications; information flows and legal authorizations; analysis of credit, balance of payments and budget; control of borrowing; definition of strategies; and computerization of information systems, as well as training and retaining people. The simple question is "has anybody looked at all of these variables / critical success factors (or most of them) in one combined model ?" ;
- Can a combination of well-balanced debt management functions work in isolation or does it require a sort of a medium of operation to link them in order to ensure that they work in harmony to produce a solid debt management system ?;
- Given the pros and cons of a powerful / successful debt management operation, what is the best path that a country

can follow to reach success with the least risk possible and with the possibility of maximum success to be gained?;

- Does a debt management system necessarily mean computerization?;
- Does an automated debt management system depend only on normal MIS or more complex forms than that (such as DSS, EIS or OSS[3]) ?; and
- Given that a country has a good debt management system, is it enough to ensure the success of a debt management operation?

[3] Organizational Support Systems.

Chapter IV
Strategic Decision Making & Debt Acquisition Process in Egypt
The Before Stage

A. The Decision Making Process in Egypt Prior to 1985

The Cabinet is the highest executive body in Egypt. It consists of 32 ministers and is headed by the Prime Minister who is assisted by one or more deputy Prime Ministers. Each minister is responsible for a given sector, such as industry, agriculture, and energy. The Cabinet addresses multi-sectoral issues, policies, and programs. The cabinet's agenda is usually set according to the scope and urgency of critical issues. In this regard, the cabinet interacts with ministries, parliament, govenorates (states or provinces), government agencies, and universities. Its decision-making process usually involves discussions, debates, the preparation of memoranda, and multi-sectoral studies.

In addressing its issues, the Cabinet has four main sectoral committees, each with a membership of various ministers, which operate according to their specializations and areas of work. These committees are the High-level Strategy Committee for Economic and Financial Affairs (HLEC); Production and Services Committee; Social Services Committee; and Legislative Affairs Committee. The Prime Minister coordinates the work of the ministries and policies are made in conjunction with the Supreme Court and the President. In this thesis, our scope of interest will be the HLEC as the targeted group for research and study.

One basic function that was assessed and analysed during the course of our empirical research was how the strategic decision making process took place at the cabinet level, mainly at the HLEC. The period assessed was before the inception of the IDSC in general and DM&EM in particular.

Interviews conducted with different members of our focus groups

revealed that strategic decision making prior to 1985 was a shapeless, undefined process. It was very difficult to study due to the fact that there were no defined patterns to follow or impose on strategic level decision makers. During the research a set of variables was identified which were unique to each situation and person interviewed. In other words, we determined the decision making process to be affected by the following variables:

1. Each decision maker possesses a unique set of management tools, techniques and mechanisms that allows him to manage.

   The tools, techniques and mechanisms depend on the decision maker's background, style of management, work experience, the nature of the situation faced (How strategic or tactical is it?), and resources available (manpower capabilities, time required for developing new procedures and systems, money and the available information sources).

2. Top/strategic decision makers depend highly on support assistants who act as topic(s) executives (advisors and/or researchers) on specific issues.

   Decision makers associate certain topics and issues with a person or a group of people who study, analyze and recommend alternatives for their superiors to choose from. Based on the different recommendations proposed, the decision maker performs whatever decision is needed.

3. The increasing number of issues, topic(s) executives and committees available.

   To a great extent, there is a high degree of overlap, and very minor coordination efforts, between executive committees that handle various issues and topics, resulting usually in a large number of conflicts and contradictions. As a result, an extended amount of time is needed for a decision to be made and usually it is produced

at a low level of quality requiring numerous modifications and follow-up. Changes are generally required within a short period of time.

4. Topic(s) executives usually depend on very poor information infrastructure and manual systems.

   They mainly depend on personal experience and intuition during their process of analysis and recommendations. It is observed to be a very long and time consuming process which leads to the accumulation of minor problems which later become chronic.

5. The nature of recommendations issued are usually very weak, contradicting and usually uni-directional.

   A limited set of scenarios or views is put forth with no in-depth analysis nor any consideration of the possible impact of each alternative. It was a process characterized by a "trial and error" type of decision making rather than pure decision support for top people.

6. The process is human dependent rather than systems dependent.

   Issues are related to specific people who have to be present at all times and who must be involved in all issues, i.e., a "one-man show." In this respect, the topic(s) executives usually encounter a bottleneck, and deal with issues in a very shallow and mediocre manner producing poor quality work.

The decision making process prior to 1985 followed a problem-handling rather than problem-avoidance or preventing pattern (Ghali, 1993)[1]. This meant that most decisions were delayed until a problem attracted the attention of a decision maker, usually when a deadline was

[1] Interview with H.E. Dr. Youssef Botrous Ghali - Egyptian Minister of International Cooperation, 8 November, 1993.

approaching or had already passed. The factors of accuracy, reliability and quick response were not among the criteria for evaluating the performance of decision-makers. Decision-makers themselves lacked adequate guidance, support tools, information bases, scenario generating capabilities and good follow-up systems. Therefore, it was not a problem of resources (availability of computers, software system and human resources) but rather a problem of bureaucracy, tedious workflow and procedures, and huge numbers of un-needed and idle personnel. On a more general level, it became apparent to us that the problem stemmed from a lack of awareness about the power behind the proper use of information, computer systems and trained personnel. Figure IV-1 presents a diagrammatic view of the decision making process prior to 1985[2]. This figure is meant to show the position of the Cabinet which acted as the central coordinating body directly interacting with the various ministries, parliament, government agencies, universities, etc. The Cabinet did not possess any capabilities of a "kitchen-like" facility that prepares, studies, analyzes and recommends decisions to be implemented. The above six variables represented the main factors that influenced the strategic decision making process of the Cabinet in the past. In the process of our research, we tested the viability of each factor and cross-checked them against the different case studies conducted.

[2] El Sherif, H. and El Sawy, O., 1988.

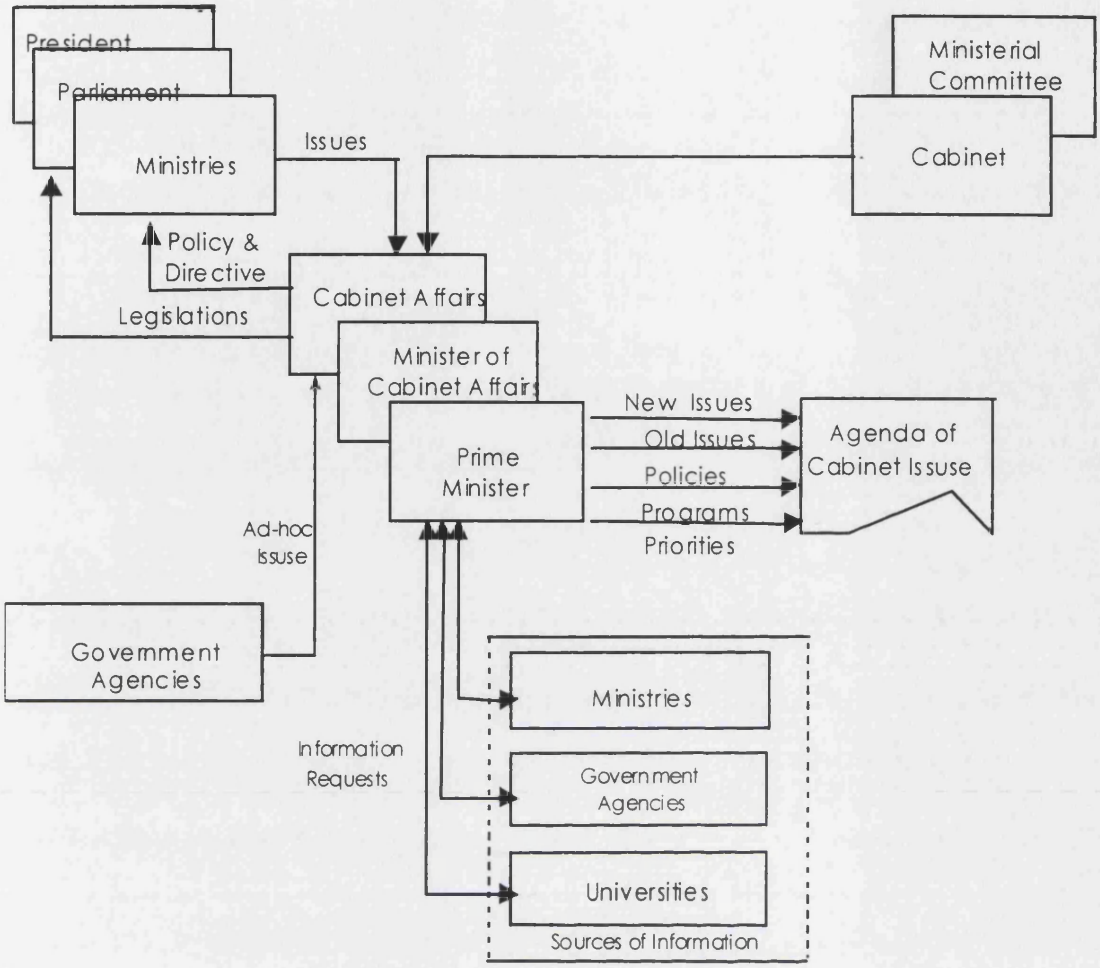


Figure IV-1
Decision Making Process prior to 1985

B. Debt Management Process in Egypt Prior to 1985

Faced with the typical problems facing developing countries, including heavy foreign debt, a balance of payment deficit, a high illiteracy rate, poor technological infrastructure, lack of financial resources and unemployment, Egypt had been striving to implement a national strategy for instituting a socio-economic development program. In the mid-1980s the government adopted a far reaching supply-push strategy for the introduction, implementation and institutionalization of large information and decision support system projects aimed at

improving decision making at the Cabinet level with respect of socio-economic development planning. The strategy had to be tailor-made to the decision-making needs at the Cabinet level, which addresses a variety of socio-economic development issues. These issues include public sector reform, administrative reform, balance of payment deficit, debt management, and privatization. At the Cabinet level, information needs and decision making were characterized by data rich and information poor decision support systems; operations research and management science (OR/MS) specialists and experts isolated from the decision makers; and the use and application of computer systems viewed as an end rather than information technology tools that could support decision making. Initially, the focus was more on technical issues rather than decision outcomes. As a result, the urgency and criticality of decision making issues necessitated provision of I/DSS services to enhance the decision making process using the most appropriate state-of-the-art information technology, tools and techniques.[3]

1. Debt Acquisition Process

In the early 1980s, Egypt faced a severe economic recession, which was characterized by deteriorating income, a decrease in foreign reserves, and a sharp increase of unhealthy debt burdens. There were a number of reasons why Egypt needed debt management reform. Egypt's main objective was to reduce the heavy debt burden on individuals as well as on the government so that it could concentrate on other development issues and problems. According to a key decision maker who described the debt management process prior to 1985, "We used to perform debt management functions soley to satisfy

[3] El Sherif, H. and El Sawy, O.,1988.

others or to respond to pressures from creditors. The reason for this was that in order to secure new funding, Egypt needed to appear as if it is regularly performed full debt management functions" (Ezz, 1993).

Popular opinion, observed during the course of our empirical research, shows that prior to 1985, the debt acquisition process in Egypt was conducted in a haphazard manner in the sense that it lacked any kind of framework or modality that could govern, regulate or guide such a process. At that time, a government organization or agency was permitted to make contact, ask for whatever new money it needed, agree to any proposed terms, and contract new loans, and all without referring to any coordinating body or regulating agency. There was no record keeping which could account for total borrowed money at any one point in time. For creditors, Egypt was an excellent debtor from whom they received excellent terms.[4]

Most policy makers interviewed agreed that external borrowing was deteriorating and the number of bad debts was rising. It was very clear to outside observers that Egypt did not posses a structured procedure for its borrowing agencies, or a central coordinating body objectively setting guidelines for the process or for monitoring its implementation. Moreover, during the early 1980's, the period during which most of the debt accumulated, Egypt was faced with a massive number of creditors who had surpluses and encouraged over-borrowing.

At that time, debt was looked upon as an "injection" of emergency funds to be used for acquiring basic needs. It was never assessed for feasibility and there was never any assurance that debt would contribute to the success of macro-economic policies and practices. According to the Egyptian Cabinet Minister for Economic Affairs, " It

[4] Interview with H.E. Dr. Salah Hamed - Egyptian Deputy Prime Minister and Governor of the Central Bank of Egypt, 10 October, 1993.

was next to impossible for any Egyptian decision maker to calculate and identify the total debt figure (real figure) or to determine who the creditors actually were"[5]. Consequently, it was extremely difficult to calculate the yearly debt burden and debt service in relation to gross national product (GNP) and total exports[6]. Similarly, it was very difficult to know precisely how much the annual debt service (principle and interest) represented Egypt's generated sources of income. Key questions such as is Egypt capable of paying its annual debt service or not could not be answered most of the time[7]. As a result, it was next to impossible for the Cabinet, HLEC, any minister and / or any top decision maker to balance the malfunctioning economic situation and issue the correct policies and strategies without first being able to view the global picture.

2. CBE - LEDD organization structure, work flow and operating procedures

Studying the work-flow and operating procedures at the CBE – LEDD prior to 1985, the "before stage" to the DM&EM program implementation, allows us to measure the degree of success and impact of the debt management and economic monitoring program implemented jointly by the CBE and the Cabinet IDSC. In this way, we can assess the contribution of the work performed in the process of

---

[5] Interview with H.E. Dr. Atef Ebied - Egyptian Minister of Public Enterprise Office and Minister of State for Cabinet Affairs, 24 November 1993.

[6] " Debt service to export ratio if more than 25% is a crisis state, but less than 10% is acceptable. For Egypt it was26 % and now has been reduced to 12%, It is expected to reach 6 - 7% in the next two years. This is a very comfortable figure, i.e. very reasonable cost of financing for our debt. It is an acceptable rate even for developed and economically stable countries. Economically, financing by debt is the best means of financing not from your own resources. But we have to be very careful on the debt utilization, debt service ratio and debt pay back to maintain efficiently and not slip into a debt crisis". Dr. Mokhtar Kattab, Director of the DSS department at the Cabinet, IDSC, Interview, 1993.

[7] Interview with Dr. Moatasem Kaddah - National Project Manager for the Egyptian Debt Management Program, 3 July 1993.

enhancing and leveraging strategic decision making and its value, if any, to overall results. It was our belief that studying the "before stage" is extremely important for the following reasons:

1. Institutional memory persists.
2. Sometimes valuable good technical systems fail institutionally due to the lack of documentation of the phase prior to implementation (El Sherif, Interview -1993).
3. I/DSS and concepts go beyond computerization, which already existed in the CBE-LEDD.
4. As the program is one of the few experiences of its kind, the diagnostic work which was used to sharpen the objectives and the deliverables of the program need to be well documented together with the program's objectives, scope, output and successes / failures. It is our belief that this in itself could be a comprehensive package that could represent a transportable experience with few modifications to other debt-burdened developing countries.
5. Compared with other experiences such as in Mexico and Turkey, in order to be able to assess the degree of impact and measure the accomplishments of the DM&EM program.

a. CBE - LEDD organizational structure:

Figure IV-2 represents the organizational structure of the CBE-LEDD, which consisted of a director, general manager, four unit heads who act as deputy general managers, and five main units which supervised various groups.

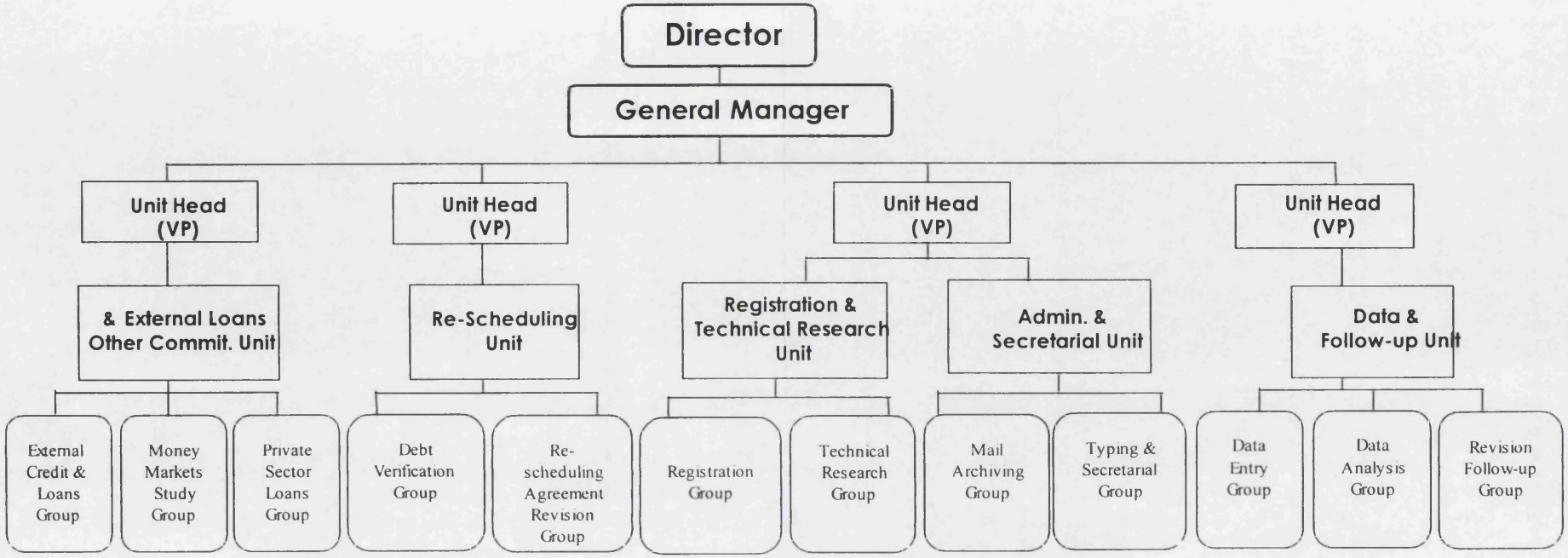


Figure IV-2

CBE – LEDD Organizational Structure

a. Top Management Department

1. Director
2. General Manager
3. Four unit heads (VPs) for
   a. External loans and other commitments unit;
   b. Re-scheduling unit;
   c. Registration, technical research, administration and secretarial unit;
   d. Data and follow-up unit.

B. Units Breakdown

1. External Loans and Other Commitments Unit

(Total of 6 employees)

   a. Loans and external credit facilities group;
   b. Money market study group; and
   c. Private sector loans group.

2. Re-scheduling Unit *(Total of 6 employees)*
   a. Debt verification group; and
   b. Re-scheduling agreement revision group.
3. Registration and Technical Research Unit

(Total of 15 employees)

   a. Registration group; and
   b. Technical research group

4. Administration and Secretarial Unit

(Total of 8 employees)

   a. Mail and archiving group
   b. Typing and secretarial group

c. Data and Follow-up Unit *(Total of 12 employees)*

a. Data entry group;

b. Data analysis group; and

c. Data validation, verification and follow up group.

b. CBE - LEDD roles, responsibilities and duties:

This section presents the CBE-LEDD roles, responsibilities and duties as stated:

1. Comprehensive study of the international money market with special focus on the development in money trends, cost of loans and investment portfolios.
2. Development of policies and strategies for external debt management in cooperation with concerned agencies.
3. Detailed studies of new external debt projects in foreign currency offered to different ministries, government agencies, public sector units, public agencies and authorities and universities prior to these organizations committing, and identifying the cost burden for each (feasibility studies).
4. Registration of direct loans and credit-facilities for suppliers and buyers in foreign currency that were received by ministries, government agencies, general authorities, public and private sector units guaranteed by public sector commercial banks. Usually, these credit facilities were established for more than one year and were thoroughly studied from the point of view of finance terms and applicability to different users.
5. Registration of government loans which were provided to various agencies by the Ministry of International Cooperation.
6. Handling of record keeping and systems for following-up external international and Arabian debt commitments.
7. Analysis and forecasting of external debt and other commitments

in addition to preparation of regular bulletins and reports required by national and international agencies.

8. Preparation for and participation in loan and credit facilities agreement negotiations.
9. Automation of external debt systems in order to build an external debt and commitments data base that could provide detailed information and reports on developments in the external debt status. This data could enable top policy makers to draw the necessary policies and strategies needed for future external borrowing processes.
10. Participation in the preparation of external debt rescheduling negotiations with creditor countries. Preparations take place in the form of data aggregation, validation and verification in addition to revising debt re-scheduling project agreements due to be discussed by Egypt and those countries involved.

The mandate of the CBE - LEDD appeared well thought-out on paper, but was never adhered to in practice. Numerous problems impeded proper implementation of the espoused roles, responsibilities and duties, including: Lack of resources; absence of qualified staff; complexity of the Egyptian debt stock; the very primitive work flow and procedures followed; and lack of user involvement and clear requirements. As a result, the CBE - LEDD was properly labeled but did not perform any task beyond debt stock inventory, and even this process lacked precision.

The above documented charter enabled us to identify gaps in performance and less-than-perfect adherence to the procedures set forth by the CBE-LEDD. The research procedures followed were discussion and informal interviews with key persons at various

hierarchies. It was necessary to locate and acquire reports and documents on the workflow and procedures in addition to sample work tools such as forms, books, and internal memos, meeting minutes and performance evaluation reports. Comprehensively, our observations on the critical bottlenecks and problems that were evident in the process and procedures followed were:

1. The system that provided general reports and statistical bulletins to numerous concerned agencies was mainly dependent on data aggregated, manipulated and tabulated from sources outside the department. It did not incorporate any data processing capability or cross-checking mechanisms for incoming or stored data on the data base that could be used in the preparation of requested statistical or decision support reports for decision makers.
2. The creation of the "data and follow up" department which recorded the detailed external debt data registration on the data base was an apparent duplication of work being done at the "registration and technical research" unit (Kaddah, interview - 1993).
3. The number of data sheets and / or reports received from different banks and ministries exceeded 6000 per month. Sources were:
    - Commercial banks 2000 per month
    - CBE branches 1800 per month
    - Ministries and other agencies 2500 per month

    None of the above sources was interested or had the ability to compare and cross check data validity with other sources (Kaddah, interview - 1993). Moreover, developing a proper automated mechanism for data entry, validation, manipulation

and processing in addition to data exchange and dissemination with other concerned sources became necessary.

4. The manual system used in regularly recording and producing the monthly statistical bulletins, by the register and technical research unit, was very inefficient producing low quality output (Ezz, interview - 1993).
5. A strategy for specifying the borrowing sources, borrowing terms and conditions was not clearly defined. Additionally, CBE-LEDD staff was unable to identify or classify the borrowing economic sector especially when the purpose of the loan differed from the main "umbrella of activities" of the borrowing sector. For example, a loan for the construction of a tourist hotel for the Ministry of Tourism might take the code for this ministry or that for the Ministry of Construction and Development. The problem worsened when the loan was divided among different economic sectors such as a government loan distributed among a number of ministries. This led to an imprecise coding of borrowing economic sectors and the inability to generate classified reports for these sectors.
6. Data on loans and credit facilities was not used (archived and not used for tracking or any follow-up purposes) after the loan was approved and recorded on Form 1, Loans (see Appendix IV-A), and in the database (Ezz, interview - 1993).
7. The computer system was used only as a facility for debt figures inventory and was not utilized in processing or manipulation activities. The computer was viewed by some staff, who had little knowledge of computers, as a mechanical or electronic means of debt stock keeping and easy report generating. Other employees feared the computer due to ignorance in how to operate it, i.e., difficulty in learning a new system after reaching senior position, fear of being replaced by the computer, and preference for

hand-written paperwork (physical paper copy), etc.

8. The very clear and striking phenomenon was that data processing and manipulation were performed almost by hand. Resistant to change, staff would to ask for a report print out and would calculate and generate all requested answers to inquiries manually. Clearly, the enormous amount of data and the use of very complicated models such as that used by the IMF, World Bank and the Paris Club, manual calculation usually resulted in a multitude of mistakes that required time-consuming effort to rectify. The final result was an overdue, unreliable and valueless document that top management could not depend on in developing strategies or making decisions.

Based on the above observations and the results of the case studies conducted for our research, we were confident that most of the CBE-LEDD roles, responsibilities and duties (presented in the following section of this chapter) were well charted in the department books, but were not adhered to in practical implementation. In other words, the charter was wishful thinking on the part of CBE top management but they failed to carry through its design.

c. CBE - LEDD staff background and work experiences

The LEDD staff collective backgrounds and work experience at the time can be summarized as follows:

1. Most of the employees had varying money, banking, and external financial operations experience. For newly recruited employees, intensive training courses and skill building programs, in their fields, were being organized;
2. Some employees received special on/off site courses in debt management such as:
    - World Bank external debt management courses; and

- IMF economic analysis tools and techniques training programs.

3. Others were trained at the Cabinet IDSC on:
   - Introduction to PC s;
   - DOS, Data Base and Lotus 1-2-3; and
   - Data entry and validation techniques.
4. Employees were trained on report preparation and generation by an international expert from the IMF.

d. LEDD work flow and procedures

As mentioned before, CBE-LEDD was and still is divided into five main units (Figure IV-2 above). LEDD workflow and procedures in respect to each unit are discussed individually below:

External Loans and Other Commitments Unit

The External Loans and Other Commitments Unit's work flow and procedures were as follows (Figure IV-3):

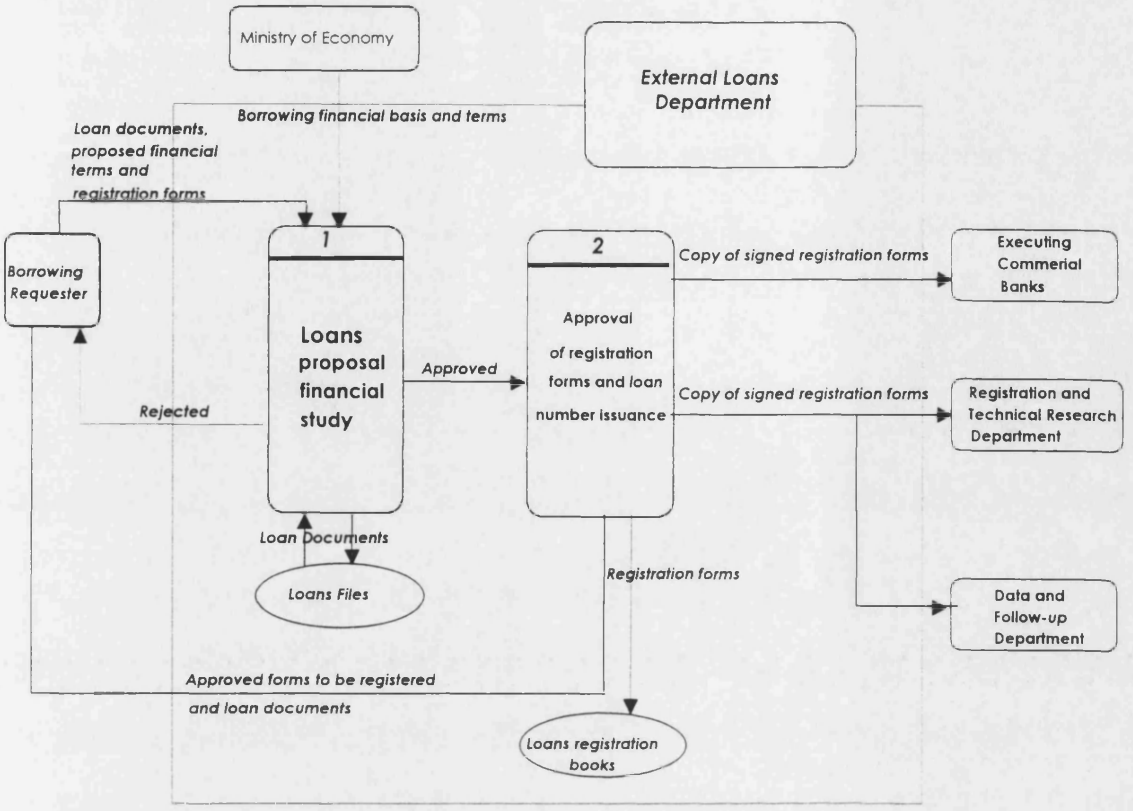


Figure IV-3

External Loans & Other Commitments Unit Data Flow

1. Supports ministries, government agencies, general authorities, public sector agencies, and universities in the process of committing to new direct external debt, whether short-or-long terms, in foreign currency, for a minimum of a one year credit period. It provided support in the form of advice on proposed borrowing terms, i.e., suitability of interest rate, debt installments burden, credit period and credit grace period, if any, and other terms and conditions contained in the loan agreements.

In providing such a service, the Unit followed the steps below:

a. The agency files a request in the form of a detailed letter of the operation and attaches the proposed financing projects with a credit period of at least one year, seeking the opinion of the CBE on the degree of suitability of the loan to its context;

b. Requests were usually delivered by mail or by hand, registered in a special registration book at the LEDD, and then distributed among several specialized groups;

c. Requests were shared between employees at the different hierarchical levels to obtain detailed analytical views which were then consolidated and aggregated in a comprehensive feasibility study with comments and recommendations on accepting, modifying or refusing the proposed finance project. In case of acceptance or minor modification, the whole study had to be reviewed, revised and approved by the unit head and the department general manager;

d. Unit head and the general manager comments, if any, were incorporated into the overall report and a response was prepared and sent to the concerned agency;

e. In case of loan or credit facility approval, a registration process took place during which detailed data was recorded, by hand, in special books prepared for that purpose;

f. One copy of Form 1, Loans, was then returned to the concerned agency. The concerned local Commercial Bank indicated on the form that registration took place on a certain date, and a serial number was assigned;

g. In case of loan or credit facility rejection in response to unsuitable terms, either due to high interest rates, a short credit period or any other unsuitable burden, a detailed letter was sent to the concerned agency and the concerned local commercial bank explaining the reason for refusal. This letter was used to strengthen and support the agency during re-negotiation of the proposal terms; and

h. Usually special cases such as those of relative importance or containing a new borrowing basis to the department took longer to

prepare and respond to.

It is worth noting here that most of the outcome of loan and credit facilities requests were heavily dependent on the money and banking experience of the unit's employees, experience accumulated from previous reviews, support acquired from periodicals on the international money market, and changes in interest and currency rates.

2. Monitors direct loans and suppliers' credit facilities foreign currency, which is received by ministries, government agencies, public authorities, public sector companies and universities from abroad. Additionally loans and credit facilities recommended by private sector individuals and guaranteed by public sector banks had to be reviewed by the CBE before being committed. The General Monetary Department at the CBE regulated the process by the Internal Loans Law, Number 1, issued on 29/8/1978 and modified in 15/1/1987 and again in 8/10/1987. Agencies applied for approval on request Form 1, Loans. Furthermore, firm instructions were issued by the CBE on 23/9/87 to public sector bank's regarding the importance of referring back to the CBE all registered foreign currency direct loans and suppliers' / buyers' credit facilities acquired by these banks clients. All loans still had to fulfill the minimum of a one-year credit period.

3. Government loans, assigned by the Ministry of International Cooperation to different agencies, were guided by the Internal Loans Law, Number 1, issued by the General Monetary Department at the CBE on 15/1/1987. All concerned local agencies had to complete Form 2, Loans, (see Appendix IV-A) regarding government loans that were assigned by the Ministry of International Cooperation. All forms had to

be delivered to the LEDD at the CBE in order to ensure registration. The following process took place:

a. The in-coming loan forms and all required attachments were received;
b. Proposed forms were thoroughly studied by specialized staff, group managers, and unit heads in order to ensure that they fulfilled all conditions and financial terms related to government loans;
c. Data on the approved proposals was registered in special books prepared for that purpose;
d. Copy of the approved proposal was sent, after registration, to all concerned agencies and commercial banks.

Registration and Technical Research Unit

The LEDD Registration and Technical Research Unit workflow and procedure was as follows (Figure IV-4):

1. Managing documents needed for follow-up of external commitments through the following:
   a. Handling of different registration books used in recording of all data concerning Arab, regional, international government loans and other financing agencies. This data included total loan amount, loan amount used, loan amount left without use, interest rate, other burden, loan period, period before payments began and installments time table;
   b. Borrowing agencies supplied the department with quarterly data on the use of these loans;

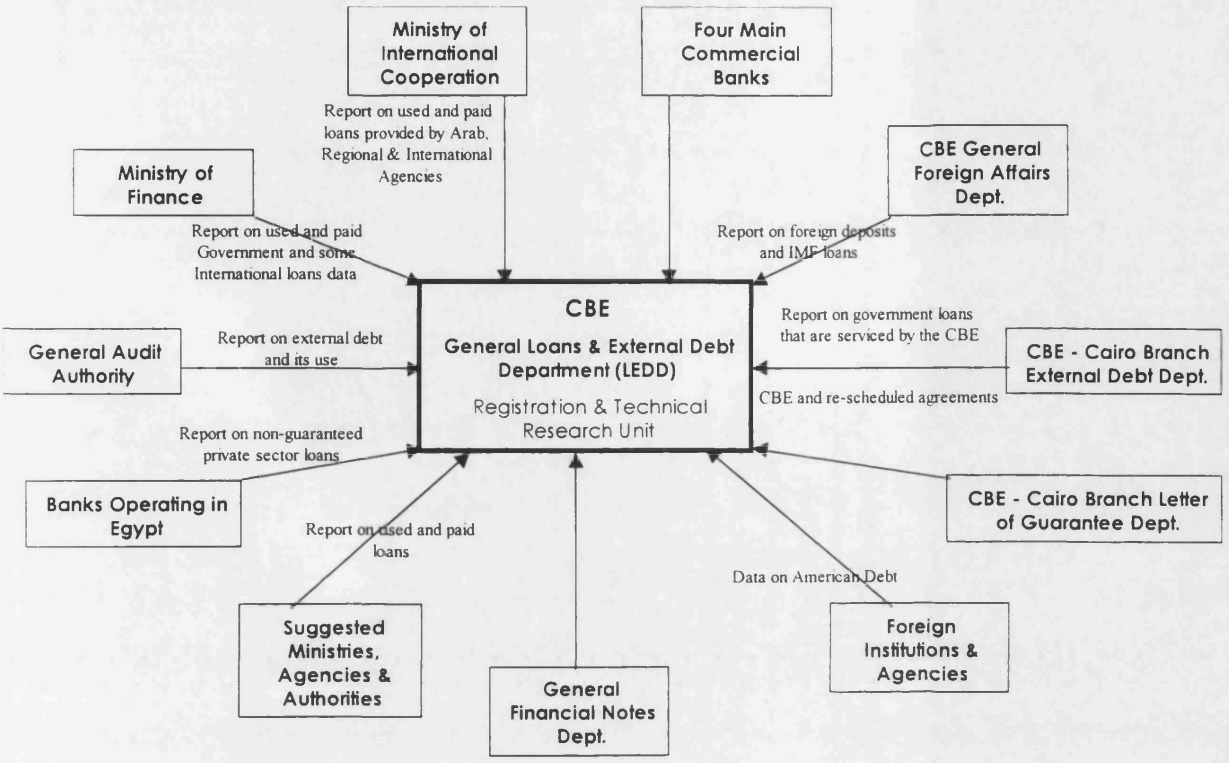


Figure IV-4

Systems Inputs to the Registration and Technical Research Unit

c. The Ministry of Finance and the Ministry of International Cooperation supplied the department with the status on loans handled by both ministries;

d. Comparing and contrasting the process that take place between what was actually supplied and what was originally recorded. This process was then approved by the unit head ;

e. In the unit, books were classified by loan source, i.e. registration books for loans provided by Arabian, European and other countries.

2. Data and statistics report preparation: (Table IV-5)
   a. Data and statistics reports were prepared by the unit on monthly, quarterly, semi-annually and annual bases. Report due dates depended on the registration books and regularity of data received from the CBE-Cairo branch, General Foreign Affairs Department at the CBE main branch, commercial public sector banks, the Ministry of Finance and the Ministry of International Cooperation.
   b. Reported data took the following form :

(For reports received from the various sources and their frequency, see Table IV-A-1, Appendix IV-A.)

1) Total amount paid during the report month and committed balance to be paid for during the current fiscal year and the subsequent fiscal years using the currency of the creditor country. The whole process was regulated by technical and economic cooperation agreements between Egypt and creditor countries;
2) Total amount paid during the report month and committed balance to be paid during the current fiscal year and subsequent fiscal years for a country's payment agreements regulated by the supplier's credit facility;
3) Report on the total late and committed payments regulated by banking credit facilities in foreign currency depending on the financial status at the end of each month;
4) Report on the total late and committed payments regulated by a supplier's credit facility in foreign currency depending on the financial status at the end of each month;
5) Report on the total commitments to be paid during the current fiscal year and subsequent fiscal years for a country's payment agreement regulated by deposits at the CBE;
6) Report on the total commitments to be paid during the current

fiscal year and subsequent fiscal years for a country's payment agreements regulated by the rescheduling process in foreign currency;

7) Report on the total commitments to be paid during current fiscal year and subsequent fiscal years for a country's payment agreements regulated by guaranteed and non-garnered private sector external debt;
8) Report on the total / aggregated commitments in foreign currency depending on the financial status at the end of each month.
9) Additionally, a full copy of all compiled data was provided to:
   a. The Economic Cooperation Sector at the Ministry of International Cooperation;
   b. The General Monetary Department at the Ministry of Economy and Foreign trade;
   c. The General Foreign Affairs Department at the CBE;
   d. General Audit Authority (annually); and
   e. The Cabinet High Level Economic Committee.

c. Reports distributed to different sources and their frequency:

(For statistics on periodic reports distributed to various sources and their frequency, see Table IV-A- 2, Appendix IV-A.)

1) A three-month statistical report was prepared from the above aggregated data for IMF follow-up.
2) Other special reports were prepared and presented to CBE top management, among them:
   a. Quarterly statistical reports on suppliers' and buyers' credit facilities registered with the department during the report period;
   b. Monthly statistical reports on total external debt in foreign currency with a comparison study on external debt figures for the

same month but during pervious years. An analysis was performed pinpointing reasons for increased or decreased debt figures; and

c. A copy of the above comparison and analytical report periodically sent to the Prime Minister and the Minister of Finance, Economy and International Cooperation.

3) Preparation of technical research and studies:

a. Studying and evaluating for reports on external loans received from various sources (general audit authority, Egyptian commercial attachés in foreign countries, World Bank and other concerned agencies). Comments and highlights were prepared in a feasibility-study format to be presented to the bank's top management;

b. Conducting research on different systems and mechanisms for export financing and credit guarantees in foreign countries based on the data reports received from foreign sources and Egyptian commercial attachés worldwide;

c. Studying the effect of interest rates on foreign currency abroad through different data sources; and

d. Other studies and research were conducted on external borrowing policies and strategies and their local and international development over time.

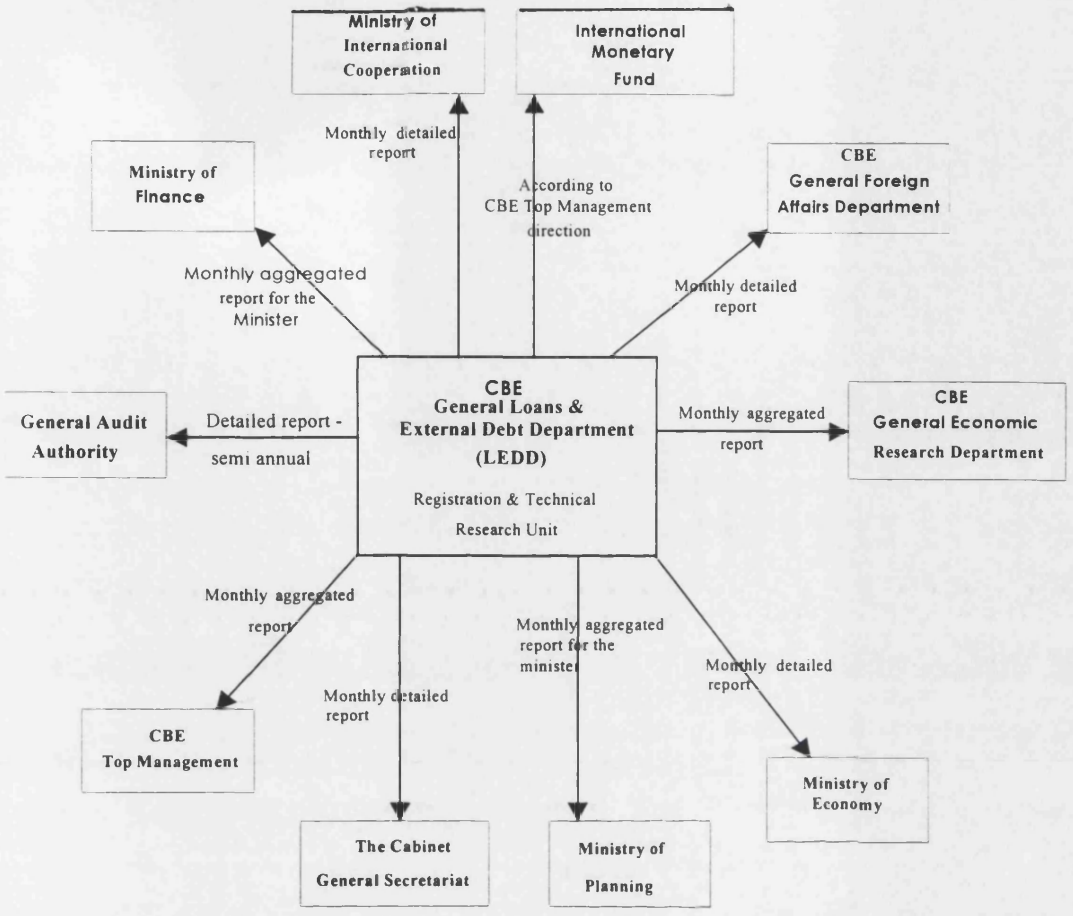


Figure IV - 5

System Output from the Registration and Technical Research Unit

Data and Follow-up Unit

1. The Data and Follow-up Unit (Figure IV – 6) follows up on all loans and credit facilities' operations that were registered at the CBE using special computer forms that were completed and revised by the concerned local banks and then returned to the LEDD. These forms were as follows:

a. Form **A**

All basic loan and credit facility information was recorded in addition to information on providers and users, expenditures to date, repayment methods, related interest, commission and

other burden repayment, and the method of calculation used.

b. Form **B**

Information on paid principle and interest and other burdens and commitments that have already matured and actually been paid.

c. Form **C**

Information on the expended part of the loan or credit facility and the method adopted for repayment of commitments for each type of use.

d. Form **D**

Information on unpaid maturities and the date of maturation.

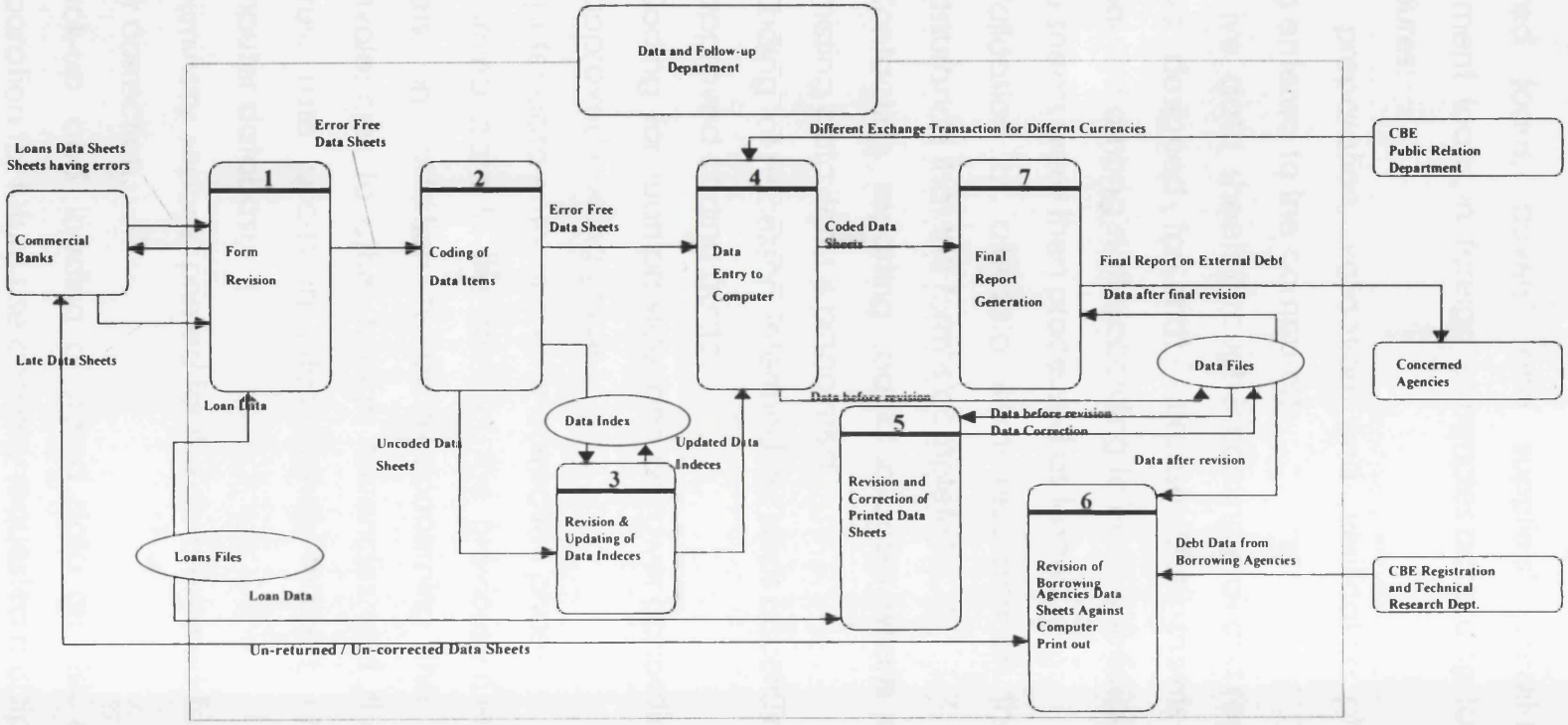


Figure IV – 6

Data & Follow-up Unit Data Flow

2. The Unit acts as a follow-up and control agent for the execution of registered loans, buyers' and suppliers' credit-facilities and government loans in foreign currencies according to the following procedures:

a. Data preparation, validation and verification phase (before being entered to the computer):

1) Receive data sheets through incoming mail and register them in books designed for that purpose. Data sheets were usually distributed among staff according to each's specialization.

2) Data sheets were then processed as follows:

a) Validation of all data items recorded on the sheet and assurance that the form is complete.

b) Contacting reporting banks in cases where data error or missing data items is pinpointed.

c) Coding of necessary intermediary steps according to the CBE approved coding guide.

d) Coding for loan provider and borrower according to the CBE approved coding guide.

b. Computer data entry and error correction phase:

1) Incoming data in the form of the previously mentioned data sheets, in addition to data concerning the of US dollar equivalencies to other foreign currencies and the changes in interest rate prices in international markets, entered to the computer database.

2) Preliminary reports printed for the data entered for revision and error correction.

3) Back-up and loading of stored data on disk and tapes in preparation for future use and any requested manipulation.

c. Data preparation and manipulation for report generation phase:

1) Up loading of all data previously fed into the computer for the purpose of classification, processing and manipulation as the preliminary step for report preparation for internal / external parties;
2) Revision and thorough verification of the accuracy of the above data and printing of reports that contain incorrect loan information, with errors highlighted and reasons given for the errors;
3) Correction of errors and preparation of modified data for processing and manipulation;
4) Printing of reports on actual loan data and performing comparison operations between incoming data on forms and that printed out for verification, to include error correction, the reasons for the errors, and how to avoid future errors.
5) Preparation and printing of reports on the final status of external debt and commitments in various forms and scenarios each according to the request received from an internal / external concerned user.

d. Data analysis phase:

Specialized personnel analyzed all data and system's output on external debt. Data included creditor countries (loan providers), borrowed foreign currency, pay back installments and maturation dates, total external debt figure in relation to GDP and total exports, and other key economic indicators. Policy makers used such indicators as checks and balances for economic development.

Debt Re-scheduling Unit

Due to declining economic conditions, Egypt was unable to pay back its external debts, which forced it to reschedule most of these debts. In order to do this, a series of procedures were followed in preparation for rescheduling with creditor countries. Rescheduling with creditor countries took place according to the Paris Club general framework and in the presence of representation from the IMF and World Bank. In the case of Egypt, the Data Re-scheduling Unit was primarily responsible for preparing for such activities in the following manner:

a. It studied the proposed general agreements by creditor countries (Paris Club Agreement) in order to understand fully the bases and viewpoints on which external debt would be rescheduled, as follows:
   1) Debt amounts liable for re-scheduling;
   2) Period for which debt would be re-scheduled;
   3) Debt cut-off date;
   4) Credit exemption period and pay back installment period resulting from re-scheduling; and
   5) Other terms included in the agreements.

b. Data collection:
   1) Using data from creditor countries:
      a. Classification of incoming data sheets according to local banks and debtor agencies.
      b. Distribution of data sheets to local banks and debtor agencies based on the approval document or letter of guarantee so that agency / bank representatives could revise and compare the data to their records and comment as necessary.
      c. Data sheet taken back and revised in order to ensure that each bank had revised checked, commented on and taken

the necessary action on the sheets that required changes.

2) Using data from creditor and debtor countries:

a. External debt data sheets generated for each creditor country by the external debt unit.

b. Sheets re-typed (using typewriters), revised and approved by the responsible person in the re-scheduling unit.

c. Approved sheets distributed to concerned local banks for final revision and approval or comment.

d. Sheets sent to creditors (export guarantee agencies), for signing following the Paris Club Agreement, for validation and cross check and provision of necessary feedback.

e. Correspondence took place directly with foreign export-guarantee agencies or foreign embassies in Cairo regarding specific comments on debt data sheets.

c. Participation in data validation and verification meetings and negotiations with creditor countries:

1) Data validation and verification meetings:

a. Delegates representing creditor countries, concerned local banks and representatives from the Unit usually attend these meetings, during which final data and revisions of figures took place before being recorded on the rescheduling data sheets. Finally, and after revision, all parties signed the sheets, which were then stamped by the CBE stamp.

b. An original copy of the signed rescheduling agreement was sent to the LEDD at the CBE Cairo branch to take action for payment of rescheduled interests, installments and other commitments as soon as the loan matured.

2) Data preparation and follow up:

Requested data on re-scheduled debt amounts were

prepared by the unit, and follow up on whatever issues or modifications in rescheduling amounts was carried out with CBE - Cairo branch, foreign export guarantee agencies and concerned local banks.

3) Negotiations and agreement signature:

Negotiations concerning rescheduling agreements and their signing took place at the Ministry of International Cooperation. One or more representatives attended the event from the LEDD at the CBE in addition to representatives from other concerned agencies. The main role played by the department representatives was to revise and check all figures and ensure that they were the figures agreed upon in the data verification negotiations; in addition, opinion were given on new rescheduling burdens. Full copies of the signed rescheduling agreements were submitted to the LEDD for execution.

d. Study of proposed re-scheduling agreements :

The unit was supplied with proposed rescheduling agreements that were in the process of being signed by creditor countries by the Ministry of International Cooperation, where the following took place:

1) Review of financial burdens included in the proposed agreements (country by country) with a view toward verifying interest rate prices and other burdens in order to ensure that they matched the prevailing market interest rates and that they were identical to those used in other approved re-scheduling agreements.

2) Review of all terms included in the proposed agreements in order to ensure that they matched the Paris Club general agreement terms.

3) Preparation of an executive summary of the whole process with comments and suggestions to be presented to top management to approve final concurrence before negotiations took place.

General Administration and Secretarial Unit

The General Administration and Secretarial Unit performed the following:

1. Received and recorded incoming mail in the "Incoming Mail Log" and presented it to the director, general manager and unit heads.
2. Registered outgoing mail in the "Outgoing Mail Log" and forwarded it.
3. Archived all incoming documents from other internal CBE department or external sources after notifying all concerned employees of their contents.
4. Prepared, ordered and distributed stationary and office supplies according to the department's needs on a regular basis.
5. Prepared annual furniture and other inventory lists.
6. Prepared leave and vacation requests for all employees in the department.
7. Handled personnel data files and implemented approved changes, e.g., promotion, bonuses, social status, etc.
8. Prepared permits for after-hours work or use of CBE facilities on holidays.
9. Handled overtime wage calculations based on net hours worked.
10. Handled all word processing and photo copying activities.
11. Managed the general department archiving.

More details on the CBE - LEDD are presented in Appendix IV-A.

C. The Egyptian Cabinet Information and Decision Support Center (IDSC)

1. IDSC Inception

Late in 1984, the Cabinet Minister for Economic Affairs, Dr. Atef Ebeid,[8] expressed interest in exploring the potential of I/DSS to assist the cabinet in strategic decision making. The minister identified areas of concern for the cabinet at that time. They included improving the effectiveness of the cabinet's preparation of its agenda; its consideration of issues and its decision making; improving the quality and reliability of information; improving the timeliness of decisions; and supporting the country's socio-economic reform programs. Dr. Ebeid asked Dr. Hisham El Sherif to develop a plan to address these challenges.

Following this identification process, the Prime Minister approved a preliminary project plan, driven by policy needs and national development priorities, to establish the national "Information Project for the Cabinet of Ministers" known as "IPCOM" at that time. Later in 1987, IPCOM was institutionalised and shifted from being a project to a full-fledged center, namely the IDSC.

In 1985, prior to setting up IDSC, data support for the government was provided by the Central Statistical Organisation CAPMAS. It was felt that CAPMAS provided data but not information and was not focusing on decision support. Egypt, like many developing countries, was characterised at that time as data rich and information poor. Data were available, but they were of questionable reliability and relevance.

---

[8] Dr. Atef Ebied was assigned the responsibility of heading the team responsible for negotiating with the Paris club countries, IMF, and the World Bank. He was a key figure in the HLEC responsible for coordinating the Egyptian economic reform program activities. Moreover, he was the initiator of the Cabinet IDSC, together with Hisham El Sherif its chairman, and the cause behind starting the DM&EM program using IDSC and the CBE as its team. He is now the minister in charge of the public enterprise office concerning with the phase II of the economic reform program and focusing mainly on the privatization and public sector reform programs.

Timely information was not available, and the integrity of information was often doubtful.

After the proposed plan for the IDSC was approved, a preliminary but intensive effort was mounted to put together a small-qualified support staff for the new project. Implementation began in November 1985 based upon a specific set of priorities defined at that time (El Sherif and El Sawy, 1998). In the initial stages there was friction between CAPMAS and IDSC. In subsequent years CAPMAS learned to accept the existence of IDSC but there was no real co-operation between the two institutions. Figure IV-7 shows how the Cabinet IDSC became an integral part of the decision making process for the cabinet, its affiliated ministries and other government organisations. IDSC acted as a think tank and a catalyst that possessed both the infra / info structure necessary to study, analyse and recommend scenarios for different decision-makers (Kattab, Interview-1993).

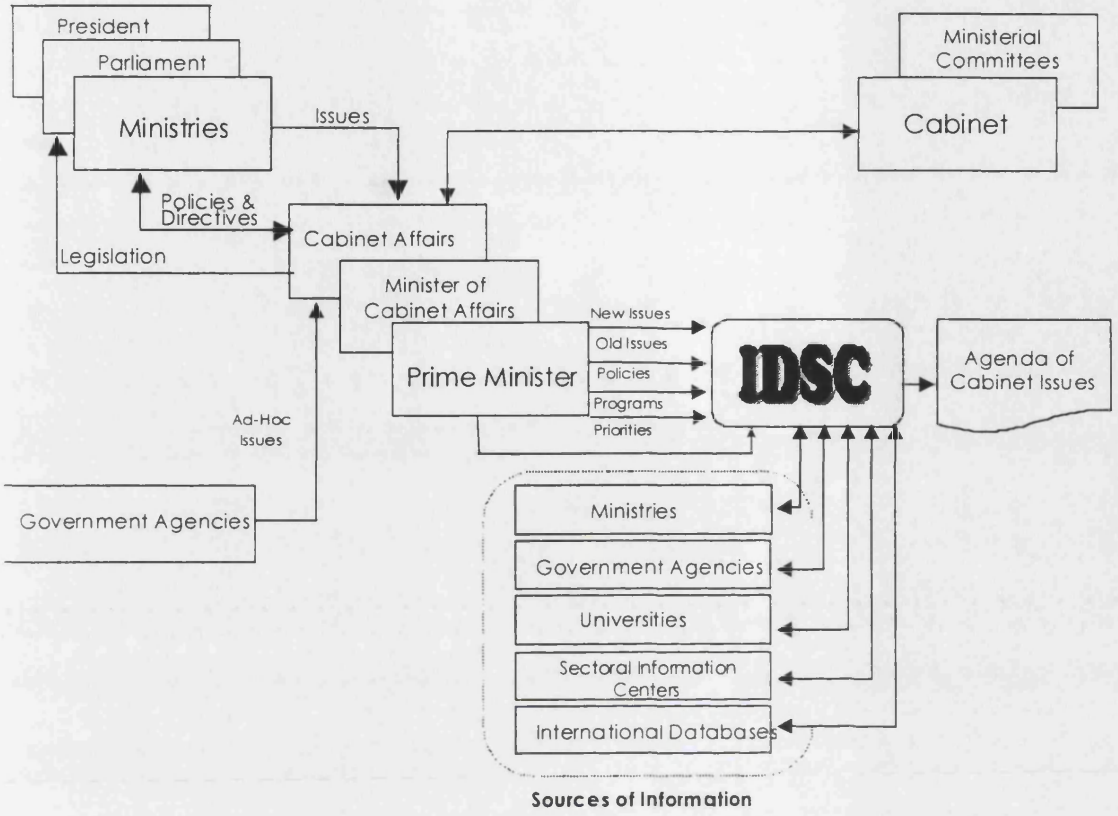


Figure IV-7

Decision Making Process After 1985[9]

2. *IDSC Objectives*

The IDSC's objectives were centred around four basic missions:

- Firstly, to develop information and decision support systems for the Cabinet and top policy makers in Egypt;
- Secondly, to support the establishment of decision support systems/centres in different ministries and make more efficient and effective use of the available information resources;
- Thirdly, to initiate, encourage and support informatics projects that could accelerate managerial and technological development of Egyptian ministries, sectors and governorates; and

[9] El Sherif, H. and El Sawy, O.,1988.

- Finally, to participate in international co-operation activities in the areas of information and decision support.

The framework of the IDSC was divided into three levels. The first level represented the Cabinet base where information and decision support systems projects were developed to support the strategic policy and decision making processes in development planning. The second level represented the national nodes where IDSC links the Cabinet with existing information sources within the ministries, national organisations and agencies and academic institutions and research centers. The third level represented the international nodes where IDSC extended its activities by accessing major databases world-wide through state-of-the-art information technology and telecommunications facilities.

3. IDSC's Management Approach

Project implementation for IDSC's clients followed different modalities. These included:

- In-house development in which IDSC internal teams provided full life- cycle development of the system or project;
- Joint implementation in which joint teams were formed with client ministries, governorates, or others around a specific project; and
- Subcontracting / outsourcing of external consultants, experts or third party companies to share responsibility for a specific project or a part of it. The choice of implementation modality for a specific project was based on a set of established criteria: cost, time, expected strategic impact, and the availability of relevant expertise. Reliable, high-quality database development was usually available and was, therefore, subcontracted; however more high level technical systems such as Geographic Information Systems (GIS) were not.
- Part of the IDSC's success can be attributed to the tailored

management approach that IDSC followed, which mainly depended on:

a. **Two-tiered teams**

Initially, this tactic was followed because of the significant shortage of individuals who could straddle both the technology and the bureaucracy of IDSC's government clients. An IDSC development team consisted of at least two people: one who was technically competent (typically a young college graduate) and another who had in-depth experienced with bureaucracies (an older person with government experience). This tactic, apart from significantly accelerating the implementation of projects and avoiding technical failures forced a dialogue between technical and non-technical staffers and, more often than not, resulted in hybridisation of both.

b. **Account executives**

This tactic involved the designation of specific IDSC members as responsible for the liaison between a particular client and the IDSC. This involved responsibility for all IS-related activities for that account and building a stronger IDSC-client relationship. A visiting expert[10] suggested that the best means to develop qualified account executives is to hybridise graduates of two-tiered teams.

c. **Crisis management teams**

This tactic came into being as it became apparent that the requests from IDSC's major clients - the President and the Cabinet - were often burdened with both urgency and criticality. Crisis response required yet another mix of skills (such as grace under pressure and empathetic support) that were natured through hybridisation.

---

[10] Professor Paul Gray of Claremont University, USA.

4. IDSC's challenges faced

IDSC's management of the development, design and implementation of decision support systems in development planning discussed above reveal a number of findings that can be generalized as a set of steps and procedures for future use of decision support systems in similar cases.

IDSC adopted a two phased approach for the implementation and institutionalization of its issue-based decision support systems projects. The first phase was concerned with the realization of information and decision support systems representing the model building phase while the second was concerned with the institutionalization process representing the management phase. The implementation phase dealt with the provision of policy and decision support, which was divided into three parts.

- First, the identification of policy needs and the full mobilization of human and technical resources to be able to achieve effective response and support;
- Second, the identification of decision areas and information requirements, which dealt with the translation of planned policy support into the specific issues of concern to the Cabinet; and
- Third, the formulation of projects with specific goals and dedicated human and technical resources for each potential area of policy and/or decision support;

The project's teams were selected to provide fast responses that are focused on results and actions. They consisted of two-tiered teams comprised of government bureaucrats and professional technocrats who were able to deal with bureaucracy and knowledgeable professionals in state-of-the-art information and decision support technologies. These two-tiered teams were hybrid teams that represented one of the key success factors in bridging the application gap between systems builders and applications users.

The institutionalization phase dealt with IDSC's experience with designing, developing and implementing decision support systems for development planning purposes. It suggested that managing institutionalization is as important as model building, and that institutionalisation is a complementary and integrated process that accompanies systems development, design and implementation. It was comprised of adaptation, diffusion, adoption, monitoring and tracking, value assessment and evaluation of decision support systems.

This practical experience led to the identification of a number of challenges related to: (i) strategic decision making at the Cabinet level, (ii) decision support systems, and (iii) the implementation and institutionalization of I/DSS (El Sherif and El Sawy, 1988). These challenges were classified as follows:

- In strategic decision making, the challenges included the efficient and effective use of scarce resources; attempts to achieve socio-economic development planning; the crisis management mode of operation; conflict resolution; and the formulation, development and implementation of policy reform programs. Moreover, they included the ill-structured nature of processes; the turbulent and dynamic environment; and finally the fact that strategic decision making is usually a group effort rather than an individual one.
- In decision support systems, the challenges included managing the development of multiple information and decision support systems; the institutionalization of such systems within their application contexts; the development of decision support systems interfaces; and the availability of decision support systems tools and generators relevant to different industries.
- In the implementation and institutionalization of I/DSS in practice, IDSC faced a number of barriers caused by lack of user involvement; inadequacy of model evaluation; problem definition; resistance to

change; and the diffusion of new model-based systems. Moreover, they included untimely, unresponsive and inadequate information and non-responsiveness to user needs. Additionally, there was the lack of top management support; lack of vital continuous communication; poor documentation; and language problems.

5. Services offered to the cabinet and ministerial committees:-

- ***Infrastructure development:*** Human resource, equipment acquisition, and financial contributions
- ***Systems development:*** To help the different ministries establish their own specialized decision support systems and databases.
- ***International database access:*** The IDSC provided information from on-line international databases and subsequently analyzed, correlated, and structured it according to the needs of decision-makers. IDSC has on-line access to international database hosts such as I.P. Sharp (Canada), Data Resources Inc. (USA), Dialog (USA), Data-star (Switzerland) and Info-line (UK), allowing it to retrieve information on socio-economics, business, investment, trade and technology.
- ***Access to local sources:*** Locally, the IDSC synthesized multi-sectoral information provided by ministries and national agencies and structured it in a way which met the specific needs of Egypt's decision-makers.
- ***Consultation and advisory support:*** IDSC professionals worked closely with top government policy makers, as well as with managers of decision support systems and information centers in different ministries, to advise on the best methodological approaches, tools, and techniques required to implement information projects and decision support services.
- ***Crisis management:*** The IDSC established a crisis management facility

and crisis management strategic support systems to enable top government officials and ministries to respond quickly and effectively to crisis situations.

The services discussed above qualified IDSC as the I/DSS provider to the Cabinet. Addressing multi-sectoral issues, IDSC's initial focus was on 20% of the issues that constituted 80% of the problems of Egypt. Those issues revolved mainly around poor economic decisions that led to the malfunctioning of the economy. The topic of our research, decision making in external debt management, was one of the most important agenda items slotted for discussion by the Cabinet. For IDSC, debt management was like other programs representing a subject classification for an area that needed (i) build-up of infrastructure; (ii) build-up of info-structure; and (iii) build-up of human capabilities that could utilize points i and ii in leveraging the decision making process for top policy makers. The result was the inception and realization of the DM&EM program.

More details on the Cabinet IDSC is presented in Appendix IV-B.

D. Conclusion (the Beginning):

We would like to conclude this chapter with a summary of the recommendations that represented the beginning of Egyptian debt management revolution. This revolution began with several joint activities between the CBE and the Cabinet IDSC and was launched by invitation from the Prime Minister and the Governor of the CBE. The invitation was extended to all Ministers involved in overall Egyptian economic reform and the structural adjustment program (HLEC). The I/DSS technological capabilities and power that could be adopted to help support, shape and leverage the decision making process in a number of related areas and specially debt management had been demonstrated. The result of this meeting was full support from the HLEC for program's foundation, a set of instructions and recommendations that led to the formulation of the DM&EM program nucleus. Under the supervision of the Deputy Prime Minister and Governor of the Central Bank of Egypt, Dr. Salah Hammed, and the Cabinet Minister for Economic Affairs, Dr. Atef Ebied[11], both CBE and IDSC put together a detailed charter and action plan. This plan was a necessity for building a state-of-the-art Egyptian debt management office starting with the DM&EM program. Below is a list of the initial key steps that were defined and followed by both organizations and approved by top management (i.e., Dr. Hammed and Dr. Ebied):-

[11] Both were interviewed as part of our case studies conducted for the research of this thesis.

1. Compilation and validation of a computerized database utilizing the following:

   a. Formation of high-level, well-selected working group for establishing the appropriate coding standards and procedures in order to ensure full compatibility and harmony of the external debt components (e.g., economic sector, loan purpose, administrative sector);
   b. Formation of a working group (2-3 employees) to revise and check pre-registered data sheets on loan terms (Form 1, Loans); and
   c. Ensuring that the revision/check process matched the new standards and procedures produced by the first working group.

2. Development of work flow and procedure systems in the CBE/LEDD department to ensure full automation through phased implementation as follows:

   a. Full training and staff awareness programs in concerned department and related departments on the use, capabilities and importance of the computer in day-to-day office work.
   b. Intensive state-of-the-art training courses and skill building programs for the Registration and Technical Research Unit in all aspects of work activities in order to enhance productivity and output. The aim was to prepare this unit to be fully responsible for the external debt database and guard against duplications or misconceptions.
   c. Intensive training courses and development programs for the Reports and Statistical Bulletin Production Group to maximize computer capabilities in producing quality periodic requests. The

reports were of three types:

1) CBE internal working reports,
2) reports and statistical bulletins for concerned agencies, and
3) reports and statistical bulletins for analysts and decision makers support.

3. Increasing the range of automated systems usage by linkups to important data sources (on-line databases); the development of the existing system through the spread of personal computers in CBE branches; and the following:

a. Commercial Banks;
b. Ministry of International Cooperation;
c. Ministry of Economy;
d. Ministry of Finance; and
e. Others;

and the development of data interchange mechanisms between the above sources and the General Loans and External Commitments Department.

4. Approving the CBE's request for assistance and support by the IDSC for full data collection, consolidation and verification from:

a. The four commercial banks on buyers' and suppliers' credit facilities and direct loans;
b. The working banks in Cairo on non-guaranteed private sector loan data;
c. The Ministry of Finance on used and paid government loan installment credit and debits;

d. The Ministry of International Cooperation on credits and debits for installment loans provided by international, regional and Arab agencies;
e. Other ministries and authorities on private loan installment credits and debits;
f. The Financial Notes General Department at the CBE on total bonds and commercial papers with varying and fixed prices;
g. The Letter of Guarantee Department at the CBE on direct loans data;
h. The Foreign Affairs Department at the CBE on deposits and loans received from the IMF;
i. The External Debt Department at the CBE on government loans and rescheduling agreements data;
j. The American Embassy on U.S. external debt; and
k. The General Audit Authority on total external debt and expenditures.

Egyptian debt management was divided among a variety of offices in the Egyptian government including the CBE, the Ministry of Planning, the Ministry of International Cooperation, the Ministry of Finance, Economy, Defense and others. The Central Bank approved and monitored suppliers and buyers' credit and short term borrowing by the Public Sector. The Ministry of Planning and International Cooperation negotiated most program-related loans for the central government and was responsible for monitoring the use of loans.

Within the Central Bank, external debt data arising from the operations of the entities mentioned above was collected in several operational departments. This information was centralized in the LEDD in the manually maintained files and registers of the CBE. This body of information could not be made use of conveniently to forecast external payment obligations, when, for example, exchange rates and international interest rates varied frequently and the manual system lacked flexibility. Similarly, flexible aggregation of external debt data, which was required for balance of payments analysis and foreign exchange budgeting, was cumbersome and time-consuming. Consequently, the types of comprehensive debt reports that are so vital to economic planners and policy makers were not available.

By 1986, and with the initiation of the Government of Egypt's (GOE) comprehensive economic reform program, Egypt requested leading technical assistance agencies specializing in economic reform in general and debt management specifically to render assistance. A team of external debt management experts, from the IMF, World Bank and the UNCTAD, made themselves available to the CBE and IDSC. They analyzed the Egyptian external debt process and concluded that a need existed for (DM&EM, 1987):

1. Increased control and monitoring of external debt operations and improvement in the approval and disbursement process;

2. Centralization of the country's external debt database in the LEDD and its computerization;
3. better utilization of computing resources in supporting the decision making process rather than their being used solely for electronic archiving;
4. Better identification of roles and responsibilities for the agencies involved in the process in addition to enhanced linkage and sharing among themselves; and
5. Better flow of regular reports / scenarios on external debt operations to the agencies involved in the formulation and implementation policy in this area.

Chapter V

Information / Decision Support Systems in Debt Management

(The Egyptian Experience)

A. Introduction

In the mid 1980s the Egyptian economy has been experiencing a growing scarcity of foreign exchange. Sharply deteriorating external conditions have been an important factor behind this situation. Oil exports, workers' remittances, Suez Canal tariffs, tourist receipts and foreign financial assistance have all declined. The result has been a drastic reduction in import capacity, low economic growth and large external imbalances. Consequently, Egypt has been unable to meet all of its external financial obligations. Moreover, foreign banks have reduced their exposure and shortened maturities, while export cover agencies have taken an increasingly cautious position and several have stopped credit guarantees. Capital inflows, therefore, have declined considerably[1]. At the same time, the US$ 44 billion Egyptian debt was considered among the world's top five in relation to the GDP. If fully serviced, interest and repayment of principal would consume more than half of the country's export revenues (Hammed, interview - 1993).

Furthermore, the difficult balance of payment situation of recent years has caused Egypt to assume a rapidly increasing external debt burden. It is estimated that debt service in 1985[2] was over 25 percent of Egypt's total export earnings. To ensure that Egypt's international credit worthiness is maintained, external debt must be carefully managed. This requires not only that debt service obligations are paid on time but

---

[1] In part from the DM&EM project document, IDSC, Cairo, October 1986.

[2] Before any debt management reform effort or the inception of the DM&EM program. (the "before stage" described in Chapter IV).

also that new debt is contracted on terms and in amounts which are compatible with Egypt's payment capacity. Proposed new borrowing should be analyzed in the light of existing obligations before being approved. Policy makers, therefore, require information on the debt services profile of existing debt; disbursement programming for committed but un-disbursed funds; available sources of financing and their terms; and immediate payments obligations.

To help overcome the foreign exchange constraint, and set the basis for sustained economic growth and employment creation, the Government of Egypt is reinforcing an overall economic reform program started in 1986, which includes major liberalization of the economy and a comprehensive structural adjustment plan. In addition a process was initiated of continuous consultations and discussions with the IMF, the World Bank and other financial institutions and creditors to help mobilize resources to close the external resource gap. Successful management of the resource gap was at the crossroads of economic recovery. In addition to the implementation of sound macro-economic policies to favorably affect key variables in external trade accounts, improved balance of payments performance was also dependent on strengthening external debt management. In recent years, factor services (interest payment) and principal debt repayment have grown in proportion to other items. Although the country's general stock of debt cannot be modified except in a program of debt rescheduling, external liabilities management can help achieve, over time, a net debt reduction through better targeting of net borrowing for productive purposes, debt conversions (debt swaps) and risk management mechanisms.

B. Debt Management and Economic Monitoring Program

The Debt Management and Economic Monitoring Program (DM&EM) was designed and built to contribute and strengthen the basis of economic management, but more directly it would reinforce the Egyptian authorities' efforts to improve balance of payments performance. The establishment of an effective mechanism to manage the country's external debt would support the objective of maximizing the domestic return of foreign borrowing which would be consistent with efforts to narrow the resource gap.

This program was formed as an integral part of the country's major economic program, which emphasizes institution building in order to enhance the economic, management and financial engineering capacities of the GOE. Furthermore, it supports the GOE in intensifying the economic adjustment program, enhancing the external use and allocation of resources, improving Egypt's credit worthiness and developing an instrument for hedging against interest and foreign exchange risks.

1. People and Reasons Behind Initiating the Program

Assigned the official responsibility from the Cabinet HLEC, the Cabinet Minister for Economic Affairs, Dr. Atef Ebied, and his economic advisor, Dr. Shawki Farag, became responsible for coordination and negotiations with the IMF and the World Bank. Additionally, a resident IMF advisor at that time, with the full support and help of a number of organizations, wrote a detailed descriptive report on the situation (Khattab, interview - 1993). His recommendations, along with other indications, helped determine the strategy for initiating the DM&EM program. It was, therefore, one of the HLEC ministers who initiated and supported the founding of the DM&EM and not the CBE or its governor

as it might logically be assumed (Khattab, interview - 1993). The governor of the CBE began to participate in setting up the program later, after the general framework and guidelines had already been established and the benefits of the program started to show feasibility and clear impact. We do not mean to imply that the CBE did not participate in formulating the objectives, scope and deliverables. In the beginning, the CBE indirectly contributed by answering specific questions put to them without the benefit of viewing the overall program mandate; afterwards they participated fully in the program and even housed the facility on their premises (Kaddah, interview - 1993).

During the course of our empirical research for this thesis, we were able to identify a number of reasons that led to the initiation of the DM&EM program. We have presented these reasons in full in Chapter IV, but would like to further discuss, in brief, some of them here:

- The vital need for a body and a system that could regulate the external borrowing process. This process was conducted in a haphazard manner in the sense that it lacked any kind of framework or modality that could govern or at least guide the process of external borrowing, the use of foreign financing and the ability to pay back the loan. There were no regulations for such a process whatsoever. Any organization or agency had the right and ability to contract for new loans directly, without referring to any coordinating body such as the Central Bank or at least by adhering to a national foreign borrowing strategy.
- During the mid 1980's there were tremendous surpluses of funds and products (mainly consumer products and not capital goods for development) which creditors offered to lend, mostly without studying the lending terms, feasibility or borrowers' market credibility. To creditors this was a good long-term investment and an excellent

strategy for disposing of their excess products and services.

- During the second half of the 1980's there were efforts as well as funds from international agencies such as the IMF, World Bank and United Nations Development Program (UNDP) / UNCTAD directed towards solving such chronic problems in developing countries. Many countries, including Egypt, were attracted by the possibility of solving external debt problems and the availability of funds for instituting a debt management program and started to establish a debt management function of sorts.
- Egyptian debt decision-makers viewed the need for such a program as crucial. The reason behind this was the fact that it was impossible to enter into any economic reform program and/or debt re-scheduling negotiations with a manual system and without knowing the actual amount of existing debt and its composition[3].

2. Program Historical Evolution

The management of the DM&EM Program views program evolution as follows:

- In November 1986, the Program team began compiling various plans to come up with the program's perspective, objective, goals and deliverables;
- By January 1987, the HLEC and the Program team were notified that Egypt was scheduled to meet with its creditors at the Paris Club in May 1987. As a result, a highly qualified team from the CBE and the Cabinet IDSC was formulated and by February 1987 all related

---

3 According to Mr. Khaled El Sayed, program technical manager, " ...the main problem in our debt stock is not the complex figures but rather its numerous origins, terms, credit sources (creditors), users (internal borrowers), borrowing currencies,etc. It is hard to believe that, before program inception an agency or public sector organization was allowed to externally contract new debt without any guidelines or control procedures to follow. For that reason it was next to impossible to respond to an inquiry or evaluate a proposal. It used to take us from two to three months to try to respond and the final result was usually inaccurate..."

hardware and software (including the installation of the UNCTAD system[4]) were already in place and operational. The team worked unceasingly for three months and successfully managed to enter the complete debt stock (5000 different-nature loans) into the database[5]. It was clear to program management that such a database would be a shock to Egypt's creditors, the IMF and the Paris Club representatives. They had no way of knowing that in such a short time data on 5000 loans could be accurately complied and used to strengthen Egypt's negotiating capabilities. Previously, Egyptian's debt decision makers were forced to depend on a manual system which was not more than 60% accurate and very slow in responding to inquiries (days, even weeks, versus hours)(Hammed, Interview – 1993). For the first time, during the Paris Club meetings, the Egyptian negotiating team was able to negotiate and correct creditor's figures and terms in addition to intellectually evaluate proposed options and scenarios in a fast, responsive and objective mode (Khattab, Interview – 1993).

3. *Program Objectives and Phases*[6]

The strategic objective of the program was to implement proper and functional debt management for the GOE through the establishment of a debt office / technical secretariat which would ultimately feed positively into Egypt's economic reform programs.

---

[4] Presented in details in point # of this section.

5 An example was given by Mr. Khaled El Sayed: " ...Yesterday, a high level expert group from the government of Bangladesh visited us. They came to study our model and to explore potential areas of cooperation. During discussions, we learned that they had started to build a centralized debt database two years ago. To date they had only entered 200 loans out of a total debt stock of 600. Comparing the above progress rate to ours (entered 5000 loans in less than three months) we determined that there was no comparison.. we were far ahead in all factors ..".

[6] Examples of debt management cases matching the above-stated phased objectives list are thoroughly presented and analyzed in sections B and C of chapter VI and in appendix VI-A.

The development objectives of the program were to strengthen the bases of economic decision making and enhance the prospects for sound economic management by assisting the government in improving the quality and reliability of its debt management information systems. As for the published immediate objectives of the program they are as follows[7]:

Phase I: Initiation and Base Building (October 1986 till November 1990)

- Building a computer-based centralized database at the CBE that would enhance and support the essential management and policy-making needs of the government;
- Guaranteeing the linkage and the cooperation between the Cabinet, the CBE, Ministries and banks through a computer network managing foreign debts;
- Improving the systems and procedures employed by the GOE in its collection, processing and reporting of external debt information; and
- Setting up legislations and rules that guarantee optimum utilization of loans and facilities.

Phase II: Institutionalization (February 1991 – January 1995)

- Leveraging good management of external debt liabilities that would help in :
  - Debt reduction through better targeting;
  - Borrowing for productive purposes; and
  - Debt conversions and risk shifting.
- Supporting the implementation of sound macro-economic policies to favorably affect key variables in the external trade accounts;

7 Source: Debt Management and Economic Monitoring Program brochure, Cairo, 1991.

- Institutionalizing external debt management to build up in-house capabilities to support the GOE in intensifying the economic adjustment program, enhance external resources use and allocation, help Egypt improve its credit worthiness and develop instruments for hedging interest and foreign exchange risks;
- Assisting the GOE to establish policy guidelines on external debt, screen proposals for new borrowing, consider recommendations for debt conversion and risk minimization and supervise and monitor overall developments related to external debt management, with emphasis on strengthening the overall balance of payment;
- Helping in reforming the foreign exchange system, reduction of the budget deficit with the improvement of the monetary policy and the formulation of an investment program of appropriate size and with appropriate priorities;
- Auditing and taking corrective actions to strengthen the debt database, particularly with respect to short-term debt and direct disbursements to suppliers by lenders;
- Reinforcing the Egyptian authorities' efforts to improve the balance of payment performance and stimulate economic growth through the establishment of an effective mechanism to manage the country's external debt;
- Promoting cooperation among other developing countries through a number of international organizations specializing in the areas of development activities and technology transfer (e.g., the UNDP, the Arab Fund for Economic and Social Development [AFESD], and UNCTAD) by undertaking developmental activities in the region; and
- Establishing a Technical Secretariat (TS) in the CBE and developing its in-house capabilities enabling it to handle, achieve and follow-up the implementation of the program objectives.

4. Program Scope

The DM&EM program scope focuses on directly providing and supporting DSS for top policy and decision makers such as the President, the Prime Minister, the HLEC, Ministers and other Cabinet members. Indirectly, it supports related individuals and institutions such as public and commercial banks, economic and financial institutions who act as cornerstones to the overall desired objective. Figure V-1 demonstrates the scope of this program:

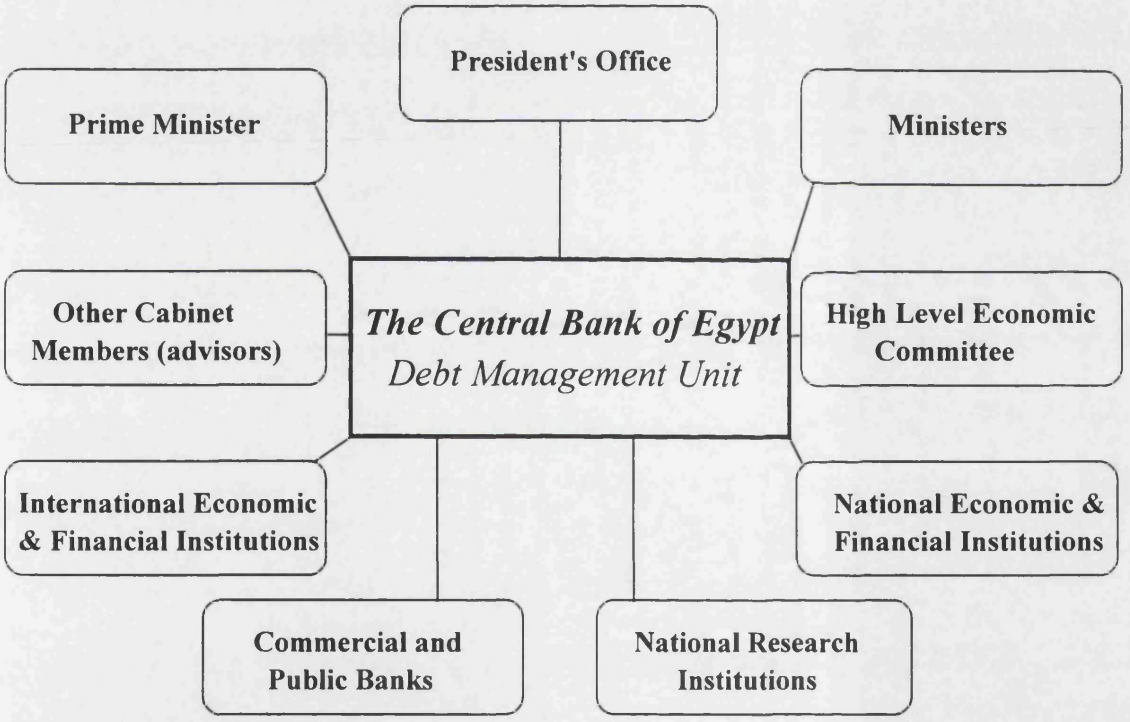


Figure V-1
CBE - Debt Management Inter-Institutional Framework[8]

8 Debt Management and Economic Monitoring Program Brochure, IDSC, Cairo, 1991.

5. Program Characteristics

a. Institutional Structure

The DM&EM Program operated under the overall supervision of the HLEC and more directly under the Ministry for Cabinet Affairs and Administrative Development (represented in the Cabinet IDSC) with the CBE being the operational counterpart agency. The Central Bank appointed a program director that was responsible for the overall execution of the program and effective co-ordination among all involved parties. The prime responsibility for reconciliation and the computerization of the external debt database was vested in the CBE-LEDD with technical assistance from IDSC.

A teamwork approach was adopted in the implementation of this program and continuous consultations took place among the different government agencies, the UNDP, Cairo, and UNCTAD in Geneva. The International Bank for Reconstruction and Development (IBRD) was kept informed on the progress of the program, receiving copies of the progress reports for comment and participating in the evaluation of achievements.

b. Overall program approach

Prior to 1985, debt management responsibility was fragmented among a variety of agencies within the government, most of which had no familiarity with computerized systems. In an informal survey of managers' and policy-makers' need for debt information, it was observed that managers lacked familiarity with automated systems making it difficult to assess the real requirements for the proposed debt management system. Also, the urgency of the program argued against the procurement of a sophisticated, custom-tailored approach to debt system development. Accordingly, the government decided to adopt a phased approach to the development of systems for

managing external indebtedness, taking advantage of existing software for the initial phase, and considering more tailored approaches after debt managers had reasonable exposure to the disciplines and capabilities of computerized systems.

Computer systems procured under this program were capable of meeting the government's most urgent needs for timely and comprehensive debt data processing and reporting; nevertheless, it was recognized that no existing package would be capable of meeting all of the government's needs (Kaddah, interview - 1993). It was envisioned that, within three to five years, a re-evaluation of the government's debt management system requirements would point to a new and significantly enhanced debt system. In anticipation of this likelihood, the government sought a system in the initial phase of the program that permitted the transfer of loan data files to any systems developed in the future with a minimum of manual re-keying of loan information.

c. Overall program task areas

The DM&EM program overall tasks can be viewed as follows:

- Improvement of legal, institutional and administrative procedures within the government to ensure the flow of timely and comprehensive debt information to a central debt office;
- Implementation of appropriate computer systems to capture, process and report debt data in formats that would support the essential management and policy-making needs of the government;
- Recruitment and training of qualified staff to administer the new debt management procedures and systems; and
- A debt audit to validate debt information maintained in the new debt system.

6. Program Challenges Faced

Program management was challenged with fully understanding the problems leading up to its development, and with taking into consideration other indirect factors (mainly socio-economic). Management was, however, capable of fully employing the latest information technology tools and techniques due to their qualifications and experience in this field. The real challenge was to marry the problem or the "context of application" to the technology (either ready-made or tailored). In a remarkably short time (less than 1 year), the learning curve for program personnel became steeper and their ability to respond to almost all inquiries within a specified time limit and with a high degree of quality became the standard.

During its initiation, development and implementation, the DM&EM Program was faced with four critical challenges that needed to be met if the program was to be a success. These challenges fall under the following categories: 1) strategic decision making; 2) decision support systems; 3) barriers to management science / operation research and decision support system (MS/OR/DSS) in practice; and 4) institutionalization challenges. Examining these challenges more closely, we find the following:

- First, strategic decision making challenges included the ill-structured nature of processes, the turbulent and dynamic environment of decision making and the fact that strategic decision making is usually a group effort rather than an individual one;
- Second, decision support system challenges included supporting rather than replacing managerial judgments, fast response to user involvement, flexibility and adaptability, and introducing prototype approaches to better understand organizational decision making;
- Third, barriers to implementation of MS/OR included lack of user involvement; inadequacy of model evaluation, and problem

definition, in addition to untimely, unresponsive, inadequate data and non-responsiveness to user needs; and

- Fourth, institutionalization challenges included overcoming resistance to change, managing the process of change, adapting the new model-based systems, diffusing knowledge about the use of new models and monitoring the adoption of new systems and their impacts on both the individual and the organization.

The model developed by the Cabinet IDSC and CBE showed that the institutionalization of decision support systems was synonymous with continuous and effective use of model-based DSS. It required continuous adaptation, diffusion, adoption and assessment of strategic DSS impact. Furthermore, managing institutionalization of strategic DSS requires overcoming a combination of the challenges discussed above (El Sherif and El Sawy, 1988).

7. Program Main Users and Targeted Beneficiaries

The DM&EM program was designed to serve a wide range of users and institutions. It focused on top level strategic policy and decision-makers, mainly HLEC, providing them with the support needed for their decision making. Additionally, the program served Egypt's President who was a regular user from almost its inception and who depended on the program for accurate, timely and reliable information and decision support services. In this respect, the power of timely and accurate information, in addition to the program's scenario generation facility, allowed the President to respond rapidly to major decisions, changes and challenges. Today, the President has a complete view of the country's total debt status and has access to tools and techniques that allow him to maneuver during negotiation (Ebied, interview - 1993).

It is worth mentioning that during one of his televised interviews with an international television channel, following successful implementation of

the first phase of the economic reform program, the President acknowledged the efforts and systems that enabled him and the GOE to analyze Egytp's real debt status and globally / bilaterally negotiate the country's future obligations.

Other users, such as the head and other members of the HLEC, i.e., the Prime Minister and ministers, frequently use the program facilities and receive backup from the Cabinet IDSC.

Some examples of users from the HLEC are as follows[9]:

- Dr. Atef Sedky, the Prime Minister, who mainly uses the program to monitor, follow-up and direct the work of the HLEC. The service provided by the Program to the Prime Minister is in generating highly aggregate reports and decision support scenarios on very specific issues. Such scenarios are in the form of suggested solutions (number of options) to a problem and the impact of each if implemented. Usually, a scenario combines numeric information, graphical representation and text explaining the findings. It is worth mentioning that the Prime Minister depends heavily on advisors and support staff due to the wide range of issues he is involved in.
- Dr. Atef Ebeid, the Minister of Cabinet Affairs and Minister of State for Administrative Development, the initiator of the program, is considered to be a heavy user of program services. He is a very visionary and professional person who is not easily satisfied with what is directly presented to him but consistently requests more depth in the current program and addition of new dimensions.
- Dr. Saleh Hammed, the deputy Prime Minister and the Governor of the CBE. Dr. Hammed depends heavily on his deputies and advisors who are themselves heavy users requiring intensive support, detailed reports and scenarios, from the program. These outputs from the

9 Collective views from empirical interviews with program users and staff, Cairo, 1993.

program are used to provide summary reports to the Governor, who is a strategy-minded person, heavily concerned with details. Before becoming the Governor of the CBE he was the Minister of Finance.

- Yousry Mostafa, Minister of Economy and Foreign Trade, who although not a regular user himself, does require status reports and aggregate figure sheets from the program. Dr. Mostafa's role is more geared towards shaping and dealing with foreign trade policy.
- Mohammed El Razzaz, Minister of Finance, infrequent user of the program due to the fact that his ministry operates its own systems. These systems deal with short-term data, i.e., the amount that will be paid on a loan for the upcoming year or other given period. The Ministry of Finance's use of the program is for validation and cross checking of its system's outputs.
- Other ministries include the Ministry of Transport and Telecommunication, Ministry of Electricity and Power, and Minister of Agriculture. These ministries represent 80% of the country's total debt, i.e., public or publicly guaranteed debt. It is vital that the program serve these main debt consumers and create the necessary awareness by setting up a full fledge capability in each of the above ministries. This capability include data collection, debt service monitoring, staff training and periodic tailored reports generation, all of which are needed by top management in their decision making.

8. Program Deliverables and Outputs

a. Program deliverables

DM&EM program deliverables started with the production of quarterly bulletins that provided information on a regular basis. After that the program started to focus on satisfying user requests, which mainly

involved answering inquiries on forecasting and programming for calculating future debt burden. One good example of these requests are inquiries that were initiated by the Governor of the CBE, which became a regular product because of its usefulness in monitoring and controlling external debt[10].

Egyptian decision-makers correlated the beginning of DM&EM program first phase with the commencement of the negotiation process both with international financial agencies and bilateral creditor countries. In their opinion, the programs' outputs and deliverables were shaped through the follows: -

- The general Paris Club agreement and bilateral negotiations with creditor countries. Each country had its laws and regulations on which terms and conditions of the bilateral agreement were built. Such bilateral differences had be accommodated by the program;[11]
- Decision makers and the program team were faced with a complex structure of multi-version agreements with different terms and conditions. Each of these terms and conditions required specially tailored scenarios and support services;
- Given this complexity, it was extremely difficult to process and simultaneously respond to proposals from different creditors while at the same time choosing the best options. The difficulty stemmed from the massive number of suggestions proposed and the complex terms for each generated by each creditor. Decision makers faced varying options such as, dropping part of its debt and paying off the balance or dropping part and rescheduling the rest ..etc. They were faced with the difficulty of choosing what would be better for the country given the overall macro-economic framework? (Kaddah,

[10] Examples of DM&EM program deliverables are thoroughly presented and analyzed in sections B and C of chapter VI and in appendices IV-A-2 and VI-A.

interview - 1993).

- Program output regularity was not affected or interrupted unless users requested certain changes or the program management determines that its is no longer effective and / or influential and / or used by decision makers. An example of such case would be the portfolio of debt management indicators developed around a certain problem such as the balance of payment deficit. The developed indicators are presented in a form allowing decision makers to think and manipulate different scenarios and choose the best given that they know preciously the impact of the chosen scenario[12]. According to program personnel, this process required continuous consultations, assessment and definition by current and potential users (Ezz, Interview – 1993). It is worth mentioning that support started with response to a specific request in the form of several printed scenarios. Later it developed to support more advanced with qualified program personnel equipped with the latest technology (notebooks) poised to provide immediate response to any type of support requested by decision makers during any mission or negotiation process. This remarkable change in credibility has completely re-shaped Egypt's image in front of its creditors and other international monetary agencies. The real reason behind this change was availability of an accurate and reliable database and significant decrease in the response time from receiving a request to answering it (weeks versus hours) (Kaddah, interview - 1993).

[11] For examples please refer to section C-3 of chapter VI.

[12] For examples please refer to appendices I-A and VI-A-2.

b. Program outputs

The program's outputs and activities have been combined to highlight the parties responsible for each of the steps needed to achieve a given output.

Output 1

Establishing and institutionalizing the TS for debt management.

Activities	Responsible Party
Organizational structure and location in CBE	IDSC/CBE.
Recruitment of consultants (local, foreign)	IDSC/CBE.
Definition of staff functions and work programs, methodology, procedures and interfaces (Local, international)	Consultants.
Procurement of equipment and recruitment of personnel	IDSC/CBE/ Consultants.
Start-up and operation	CBE/Consultants.
Design and execution of training programs	IDSC/Consultants.

Output 2

Refinement of database and information network

Activities	Responsible Party
Auditing and taking corrective actions to strengthen debt databases, particularly with respect to short-term debt and direct disbursements to suppliers by lenders	IDSC/CBE.
Identification of entities to be automated (Beneficiaries)	IDSC.
Assessment of needs of individual beneficiary and interfacing	IDSC/Benef.

Design of needed systems	IDSC/Benef.
Tailoring and implementation of systems	IDSC.
Assessment of needs	IDSC/Benef.
Training of end-users	IDSC/Benef.
Acquisition of equipment	IDSC.
Installation and operation	IDSC/Benef./Subcon.

Output 3

Reinforcement of HLEC in the area of external debt management

Activities	**Responsible Party**
Definition of responsibilities	GOE.
Definition of work programs, methodology, and procedures	GOE/Consultants.
Developing an external debt management strategy	HLEC/TS/Consultants.
Institutionalizing the external debt management function	HLEC.

Output 4

Establishment of legal framework for external debt management.

Activities	**Responsible Party**
Reviewing laws and regulations pertaining to external debt	TS/Consultants.
Performing necessary comparisons with similar legislation in other countries	TS/Consultants.

Proposing updates and modifications to existing existing laws and regulations regarding external debt.	TS/Consultants.
Approving legal reforms and modifications	GOE/EC

9. Program Successes and Failures

The research has defined success or failure to be very much dependent on program users' degree of satisfaction, rate of use, impact on the economy, and degree of leveraging debt management decision making process. We observed that a considerable number of these users felt the number of failures encountered by program management were few. Perception of successes / failures varied. We found that the common reasons behind these variations can be summarized as follows:

- The degree of involvement and/or rate of usage of the program (Kaddah, interview - 1993);
- The unique expertise that needed to be developed by the program team. This expertise required extensive learning and experimentation during a remarkably short time period (Ghali, interview - 1993);
- The team's perception of program failures, witnessed during the program's life time as damaging to the program or a challenge to improve and more refine quality;
- The definition of the metaphor "failure". Was the failure one in the real sense, in other words, would decision makers have failed in their quest with or without the program, or was the failure due to a combination of unsuccessful attempts to deliver a number of outputs in-addition to a too rapid advance in program deliverables which if taken slowly would have succeeded ?;

- The difficulties involved in debt management and the complexity of the Egyptian case versus the rate of program growth (Ebied, interview - 1993);
- The degree of top level commitment and support for the program team; and
- The need to develop, consistently, such capabilities and their required info-infrastructure (El Sherif, interview - 1993).

Applying the above success / failure factors, we concluded that program users view its failures to be minor and mainly resulting from the need to learn and master new concepts and methodologies. It was a learn-by-doing concept, according to Dr. Khattab. We realized those users' opinions on program failures originated from a belief that failure is a natural phenomenon necessary to build a unique learning curve. One success case override several failure ones, said Dr. Hammed. Dr. Ebied felt confident that the program answered more than 80%[13] of received inquires (Ebied, interview – 1993). For the program team, success was measured by what they call a "hit ratio" i.e., the number of times the program received a request and was able to generate a response to it. Successful response is dependent on two factors, quality and timeliness of the response. Our empirical research results, specifically the Likeret Scale part, shows that 88% of the debt management top decision makers sample interviewed totally agree that the program have delivered high quality response for the different

[13] According to Mr. Ezzat Abuo Ezz, the program records show that it was able to answer more than 80 % of the received inquires. Inquires were of different nature, from different source/users and have answered satisfactorily what was requested. Moreover, the DM&EM program issues a quarterly progress report in which key performance indicators such as number and names of new users, rate of program to users inquires, rate of usage of the program, ..etc are listed. We have observed that the program is regularly using a number of user surveying tools in order to assess the needed performance measures. Those progress reports were a vital tool for the program management to improvise its success: deleting un-necessay debt management area and adding news.

issues requested by them[14]. In order for the reader to feel the impact of the DM&EM program, we have conducted a comparison for the mode of operation, nature of inquires, and timeliness and quality of the response between the before (chapter IV – section A and B) / after (chapter V and VI) stages of the DM&EM program implementation.

However, there are other users who do not agree with the above argument and considered any failure, whatever the reason, to be the responsibility of program management. They believed that the program and its management were well-supplied with sufficient factors to ensure the program achieved its goals. Though they had a valid point, we do not tend to agree with their point of view simply because this is not a simple program that requires ordinary expertize and normal project management. In our opinion, the uniqueness of this program comes from the complexity of its topic, i.e., debt management. Difficulties involved in program functioning include: the lack of expertise in this field, the unique nature of the debt management in each country, the newness of the field, and the different financial / legal arrangements that take place between debtor and creditor countries. As a new field with no deep roots and no defined textbook to follow, we believe it is imperative that each indebted country builds its own debt management base that solidly supports its requirements. We learned from our research that such expertise can neither be bought nor outsourced due to its specificity to a given country. For these reasons, it is our opinion that building an expertise in this area, and similar ones, requires a unique setup with associated and specific criteria for managing success and failure.

Moreover, we observed that the program is starting to focus its forces on venturing into new areas that are considered the heart of debt

[14] Examples of users inquire and DM&EM program responses are presented in appendices I-A and VI-A-2.

management, such as the debt ceiling, borrowing currencies basket, internal rate portfolio management, etc. Development in these new areas was being implemented due to its importance and demand for it in the next phase of the reform program (Ebied, interview - 1993). The team was confident that programming in these areas, if properly developed and successfully operated, could lead to achieving the goals that they were striving to reach. Each area of the above, specifically constituted a major strategic direction for the program and for the country's economic policy in general.

10. Program System Components

The UNCTAD's computerized debt monitoring and financial analysis system (DMFAS) was considered the most suitable for debt management needs in the GOE. The Egyptian DM&EM program chose this system, but it required a number of modifications to fulfill the GOE needs.

The DMFAS consists of three subsystems characterized as follows:

- Its core is the subsystem used for database management. This was written in COBOL ANSI-74 and later modified by the program team to Oracle RDBMS. It may be installed on mainframe computers, mini-computers, or microcomputers. The design philosophy employed is that of structured programming with a large number of sub-programs grouped, as appropriate, into program runs for carrying out specific tasks. The system data files comprise a set of relational databases. The modular programming approach and the use of relational databases provide the system with the flexibility to be easily modified or expanded as the needs of the debt management unit change over time. The files created by the system are indexed sequential files (ISAM) and may be easily transferred if necessary.
- The second subsystem is a flexible table generator written in

DataBase III Plus, later modified by the program team to FoxPro. Mainframe user must use a microcomputer with terminal emulation capability to make use of this subsystem. A data set maintained on the mainframe must be off-loaded to a hard disk after which the microcomputer software may be used. This subsystem was developed in order to supplement the pre-programmed tables, which can be produced by the first system. It provides the user with the flexibility to design his own tables, specifying, for example, the sorting criteria and hierarchy to be used for generating aggregate debt data and the periodicity (daily, weekly, monthly, quarterly, annual) desired for programming of debt service payments.

- The third subsystem, the debt programming system (DPS) implemented in Lotus 1-2-3, allows the user to simulate macroeconomic balance-of-payment scenarios. This system takes into account debt service on existing debt and user-specified assumptions regarding the sources and terms of new finance in making debt service programming for any given balance-of-payment scenario. It can also be used to explore the implications of debt rescheduling on debt service payments and gross borrowing requirements. Like the table generator, the DPS is available only in a microcomputer environment. The combination of the mainframe programming language (COBOL) for database management with microcomputer-based analytical tools enables the DMFAS to capitalize on the strengths of both mainframe and microcomputers. On the one hand, the mainframe environment is best suited for storing large data sets, preserving data integrity and providing controlled access. The microcomputer environment, on the other hand, can provide the non-programmer with user-friendly programs for analytical purposes in an extremely cost-effective manner from the standpoint of both system development and training of staff.

- All three subsystems are fully interactive, guiding the user by easy-to-follow screen displays.

To make the system fully suitable for the GOE needs, the assigned team conducted modifications in the areas of arabization, database structure, database portability to more than one platform, screen lay-out, inquiry facility and the output and reports generated by the system. Their modifications were based on providing user-friendly software (encouraging decision makers to use the system) in addition to enhancing and leveraging its decision support capabilities by empowering its query and reporting facilities (easy to inquire and numerous report formats output [tabulated, graphically, etc.])

(More details on the system used by (DMFAS) the DM&EM program are contained in Appendix V-A.)

11. IDSC's Role

The empirical research conducted for this thesis clearly reveal how decision-makers viewed the role of the IDSC. They viewed it to be a leading organization in two main areas: information technology and program management. DM&EM program users for example were confident that the Cabinet IDSC was employing the latest world class technology. However, what impressed them was the rate of adaptation, adoption and diffusion in defining problems, tackling cultures, in addition to, the enormous efforts exerted in localizing computer-based capabilities to local context and language (Ebied, interview - 1993). In the areas of program management and handling of technical assistance institutions, IDSC was viewed as a perfect example of an organization successfully dealing with these areas meeting deadlines, achieving objectives, handling problems, and fully utilizing technical assistance sources (e.g., funds, experts, contacts,etc.)

(Khattab, interview -1993).

Other users view the IDSC to be vital in implementing the DM&EM program since its inception. They recall that there were a number of unsuccessful attempts at establishing similar functions earlier. What made the IDSC successful was that it started from where the others ended and took into consideration past problems, issues and failure factors. It has put significant effort into activating and consolidating previous efforts and factors leading up to the current stage. (Hammed, interview -1993)

Still others have perceived that IDSC have played a leading role in successfully handling the major cultural problems inherent in coordinating a number of competing organizations, each working to its own standards, systems and procedures (Nazif, interview - 1993). As a result, users have realized better coordination and a formulation of solid teams backed by powerful information and decision support systems facility. This facility enabled the team to handle situations such as the first and second Paris Club negotiations where one team represented the Egyptian delegation nominated and chosen as a subset of the HLEC[15].

The IDSC faced resistance and several failed efforts but nevertheless was diplomatic enough to continue the dissemination and full utilization of IT capabilities in supporting top policy and decision makers, in addition to efficiently handling national socio-economic problems. Moreover, it played an instrumental role in continuously transferring, localizing and training most government employees and program users on the usage and utilization of state-of-the-art technologies (hardware, software and systems methodologies)(El Sherif, interview - 1993). It successfully triggered the attention of top

[15] More examples on the role played by IDSC and its achievements are presented in appendix IV-B-B.

policy makers to the importance of using IT power in various socio-economic problems, besides encouraging government personnel to use, master and compete with each other in exploiting IT tools and techniques[1].

Finally, most users viewed the unique setup of the IDSC as a government organization that was being managed in a non-government mode that qualified it to orchestrate and synchronize the details of the program. None of the involved agencies, on their own such as the CBE or others, could have managed to successfully implement such a large-scale program (Nazif, interview - 1993). Additionally, none of the program funding agencies, such as the UNDP, would have supported the idea and its implementation (not only for one phase but two) without clearly ensuring that there was a body they could depend on. The IDSC ensured that this body could efficiently and effectively utilize the program-allocated resources in a value-added way contributing to a national mandate.

12. Program Future Plans

Future plans for the program include concentrating on new and complementary areas that can be used as leverage in the support of other economic reform decisions and policies such as:

a. Fully utilizing and supporting the use of information systems power in serving the GOE's other national economic requirements and needs;
b. Strategically, program users and management agree that the debt management functions performed to date represent not more than 20% of the economic information systems required by the country. Other economic areas that decision-makers strive to move forward are capital markets, internal debt stock, the banking system and the credit system. Each of these areas is a major program in itself that requires equal resources and efforts to

build and institutionalize. In the opinion of these decision makers, it is important to bear in mind when considering the design of such programs, that they must be transportable and inter-link with one another;

c. Capitalizing on this unique experience and accumulated know-how in addition to well-built credit worthiness and good image, decision makers believe that the team can lend assistance in other indebted nations' efforts by helping them solve and settle their debt problems via the shortest path possible;
d. Continuously supporting the efforts expended in developing and implementing the necessary awareness campaigns and programs concerning the importance of debt management;
e. Heavily investing time, effort and resources in building a competent human resources base that could carry this flag afterwards;
f. Exerting effort on and dedicating time to completing and operationalizing the remaining systems, such as the debt strategy module (DSM) and the debt reduction module (DRM);
g. Venturing into new complementary areas such as the legal aspect of debt management, credit management system development, capital markets systems development, Internal/sectoral debt management handling, an excellent stock exchange, and a vital export / import information network; and
h. Helping to institutionalize all efforts through ensuring the following:
   1) Defining national borrowing policies for a future defined period.
   2) Identifying the maximum yearly debt burden to commit to.
   3) Identifying the maximum yearly debt services required.
   4) Defining the relationship between the above two points to the gross national product.
   5) Identifying the optimum debt service to export ratio.

6) Identifying the optimum borrowing mix.
   - Public versus private borrowing.
   - Currency composition.
   - Optimum interest rate.
7) Defining the maximum debt ceiling.
8) Aiding in debt management techniques such as hedging, swaps, speculations etc.
9) Publicizing and promoting debt management tools techniques and concepts such as the legal aspects of debt management.
10) Establishing the foundation for a solid capital market and credit system.
11) Positively supporting corrective action efforts for improving the BOP.

13. Program Experience Transportability

We observed during the research that program users perceive the program as being able to be transportable to other contexts. They claim that the reason behind this is the fact that not only was the program developed successful, but was also successfully implemented in an extremely complex context such as the Egyptian external debt management situation. Moreover, users consider the program team's experience to be well-developed having trained themselves to deal with seemingly insurmountable situations and issues thereby making other situations seem much less complicated by comparison. They stress the point that the program team's invaluable experience was a result of: (i) the complex nature of the Egyptian debt stock; (ii) the numerous negotiation rounds held with international agencies such as the World Bank and the IMF; (iii) the accumulated experience in dealing with the Paris Club on more than one occasion; and (iv) the vast amount of experience in designing, developing and implementing large scale programs requiring extensive program management skills.

Furthermore, we have observed that the successful development of the program, supported by the accumulated experience built, and credit worthiness and positive image earned throughout the whole process, have qualified the program team to be invited to guide other nations' efforts and help them solve their debt problem via the shortest path possible. Examples of such invitations are: a number of African (such as Nigeria) and Arabian (such as Oman) countries have formally requested the GOE assistance in providing expertise in dealing with the problem. The expertise requested was in the areas of information / decision support systems, human resources development preparation and training level, project management, and negotiations with creditors and financial institutions such as IMF and World Bank level. The other important proof that chose international program recognition was an invitation from the UNCTAD for the DM&EM team to lead an effort for establishing the African Debt Management Center. Such program was a recommendation from a big number of developed and developing institutions and communities reflecting the extreme dangerous situation reached in African content with regards to this problem. This program is still being developed and implemented.

C. The Egyptian Debt Management Office

1. The Technical Secretariat (TS)

The existing LEDD in the CBE was maintained but with major job restructuring, training, and job rotation. All staff from involved ministries and banks, linked to the main database, were assigned to work under the common umbrella of the program. This ensured the full harmonization and unification of thoughts and plans that it was hoped would lead to the final goal. Computer equipment, hardware and software were collectively procured with other networking facilities. These modifications were put in place in order to qualify the CBE-LEDD

to become the debt management TS for the GOE.

Given the complex nature of the task and the limited expertise available at that time, the program team was able to learn quickly and grasp the services offered by international experts and consultants. Additionally, the team has helped in setting up the overall organization, staffing, work programs preparation, appropriate techniques development, training and hands-on support during start-up and through-out the program life span.

The organizational structure for the Egyptian debt management TS (Figure V-2) consisted of two main departments, namely the I/DSS and the Economic and Financial Analysis Department. The I/DSS department encompassed four units: Planning and Operations, I/DSS Application Development, database Administration, and Quality Control. The Economic and Financial Analysis Department encompassed four units: BOP National Accounts, Monetary and Fiscal Economics, Debt Monitoring, and External Interfacing. Both departments reported to an executive manager for the unit who was assisted by several legal experts. The TS reported to the HLEC functionally, and to the governor of the CBE organizationally.

Figure V-3 summarizes the Egyptian debt management TS interfaces with different local and international institutions, i.e., the process of data / information processing, and I/DSS outputs for different users. The feeding in of data / information takes place from debtor authorities, four main public sector banks, private banks and financial institutions, Egypt's creditors, private users, etc. Processing and scenario generation took place at the TS in the CBE. Output to users and beneficiaries inquiries went to the HLEC, the Cabinet IDSC, different debtor ministries, Cabinet Planning Unit (PU), Cabinet Economic Intellegence Unit (EIU), Ministry of International Cooperation (MIC), Ministry of Planing (MOP), Ministry of Finance (MOF), Ministry of

Economy and Foreign Trade (MOEFT), IMF / IBRD and other international agencies, etc.

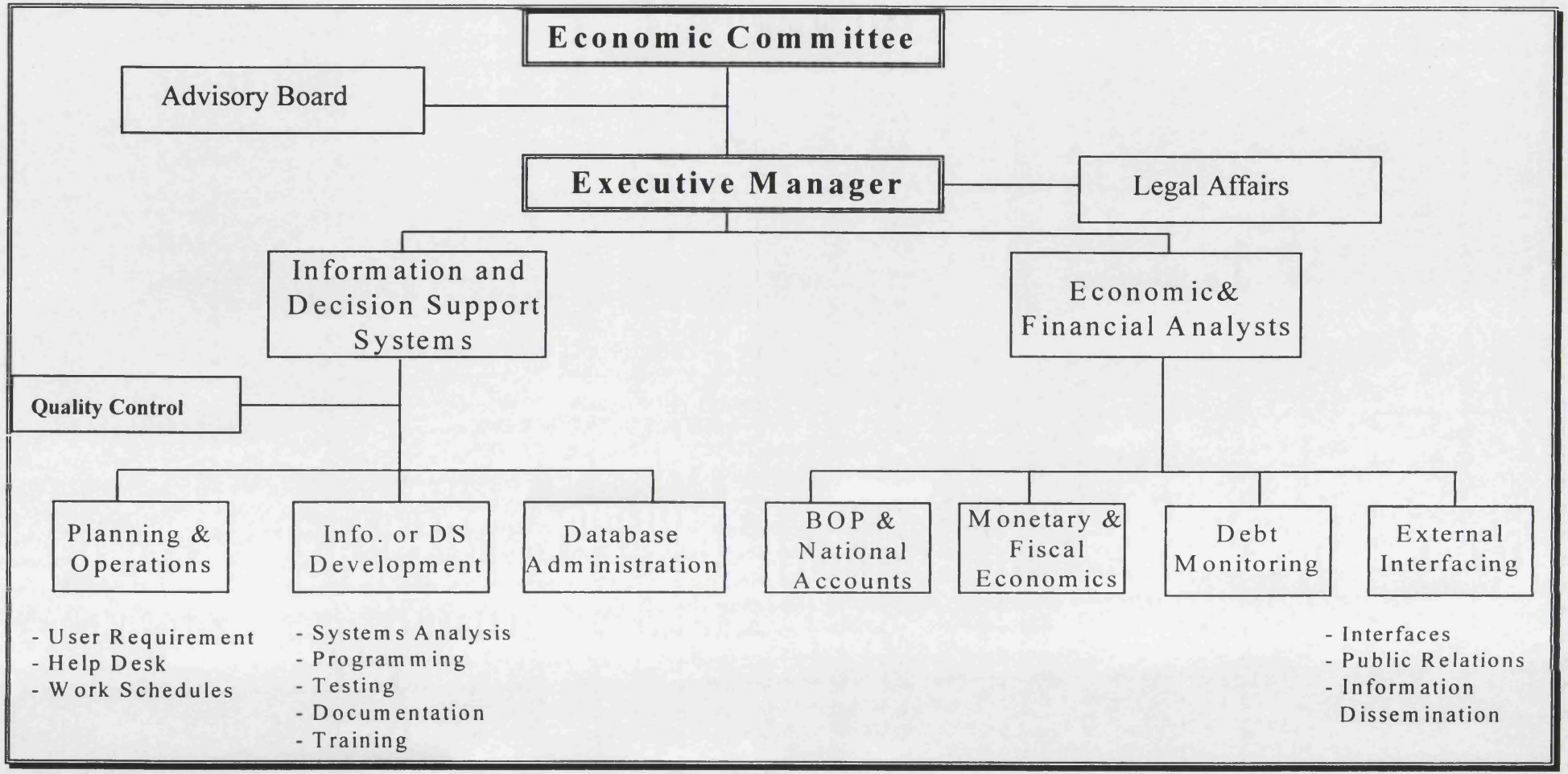


Figure V-2
TS Organizational Structure

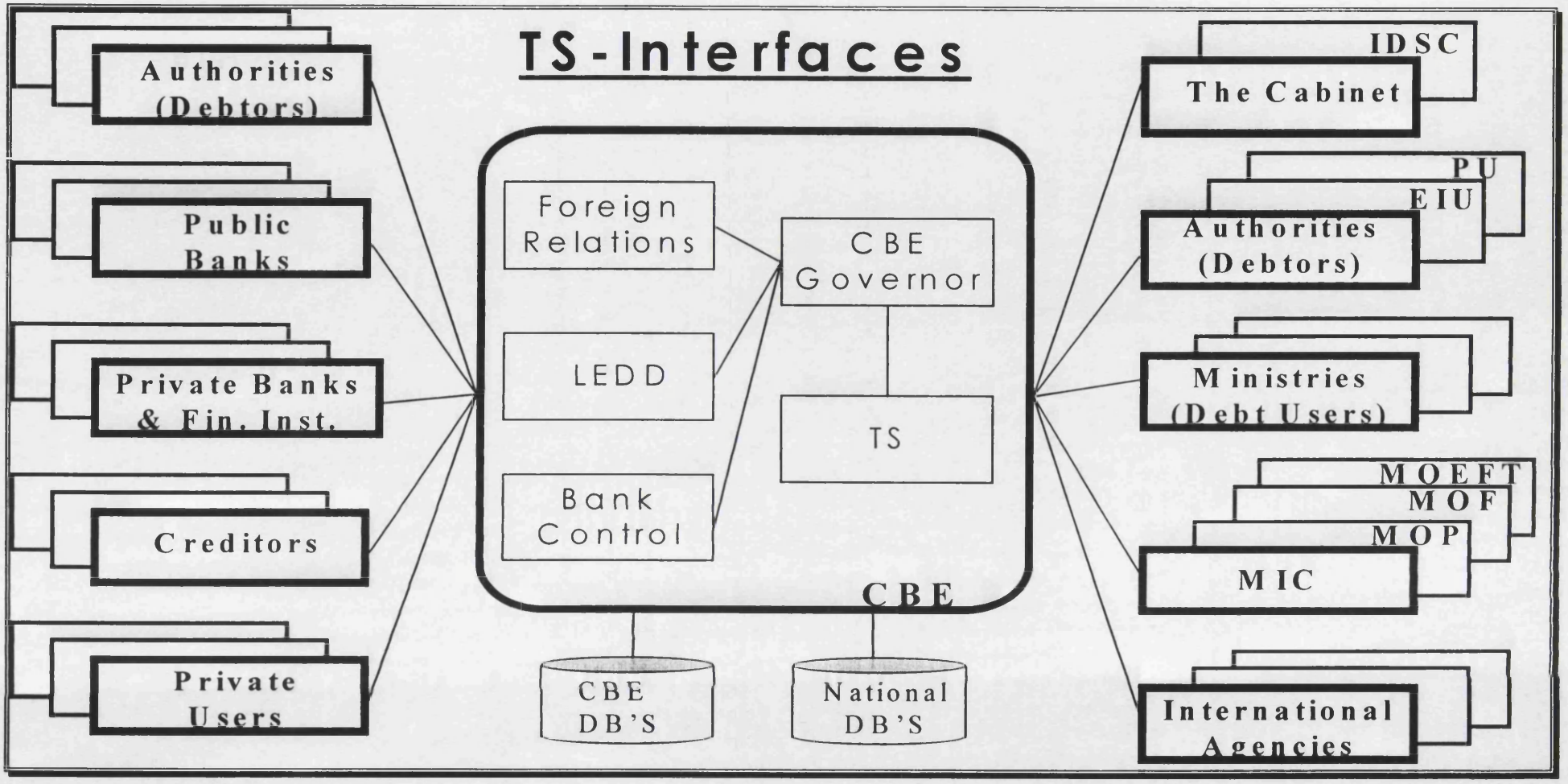


Figure V-3
TS Interface

2. UNDP / UNCTAD Technical Assistance

As part of our research, we decided that it was important to cover external factors that contributed to the DM&EM program. Among these factors were imported systems (UNCTAD - DMFAS system studied in Section D of this Chapter) and the technical assistance contributions made by the UNDP. Starting in Phase I (October 1986), the UNDP offered the GOE technical assistance in the form of funding for studying different systems available on the market; funding for acquiring the chosen system (UNCTAD – DMFAS); experts in the field of debt management and I/DSS; training for different program members in different fields (on/off site); and international exposure in the form of supporting the program team's attendance at conferences, seminars and workshops. During the second phase (February 1991) UNDP technical assistance was focused on modifying the selected software package and building up the needed debt management officers. After the compilation of a solid external debt database, the focus was turned to securing optimum utilization of the program's output. There was a need to develop analytical capabilities and establish a permanent mechanism to assist the GOE in implementing sound external debt policies.

As mentioned earlier, the GOE had in prior years attempted to improve external debt management through various arrangements but without backup and support from a specialized technical arm. With or without the program, the GOE needed to secure this technical input to strengthen its external debt management operation.

During our case studies, we observed that, although the technical support function could have been contracted to foreign firms specialized in the field of debt management, experience indicated that any such arrangement was normally more costly and, in many instances, increased the country's dependence on outside support.

Moreover, such an alternative did not always best serve the debtor, since most of the subcontracted firms had direct or indirect links to financial intermediaries.

Finally, we would like to stress the fact that the main role played by the UNDP's involvement in the program was to promote institution building namely the Egyptian "TS Debt Office", as an element necessary to sustain improvements in economic management over time. This was very important in reinforcing the GOE's economic adjustment program and was well-received by the IMF and IBRD.

3. Counterpart Support Capacity

As previously presented, all agencies involved in the external debt management process acted in a counterpart support capacity. It was well orchestrated by the HLEC, specifying each and every institution's roles and responsibilities. Moreover, the HLEC identified the prime interfaces as the Cabinet IDSC, (Dr. Ebied and his team) and the CBE, (Dr. Hammed and his team).

Being in charge of large information / decision support programs, the Cabinet IDSC adequately demonstrated its capacity to carry out contracted responsibilities successfully. It represented a well-staffed, highly technical institution that could play a vital part as an executive counterpart. (The Cabinet IDSC is discussed in more detail in Chapter IV, Section C)

The CBE LEDD showed serious commitment and assumed the tasking of TS Debt Office. However, neither institution had the needed expertise in external liability management. The alternative was contracting consulting services, both locally and abroad, in order to develop local professional capabilities. The training component under this program, combined with hands-on experience, was very effective in developing the in-house technical know-how, which prior to this time, had been lacking. (The CBE - LEDD is discussed in more detail in Chapter IV,

Section B)

4. TS debt office responsibilities

The Egyptian debt office (TS) responsibilities can be summarized as follows:

a. Prepare national debt policies and strategies, in a cooperative effort with responsible government agencies, which define sustainable levels of external debt that are consistent with sound macro-economic balances;
b. Elaborate on sectoral break-downs of external debt obligations with a view toward enforcing cost recoveries and pay-backs;
c. Develop various loan approaches (short, medium and long) to secure adequate sources of external finance for handling the debt portfolio;
d. Ensure regular up-dating and refinement of the debt database and extend its coverage to all loan categories;
e. Analyze sectoral breakdowns in balance of payment components with a view toward strengthening their structure and position;
f. Promote adequate linkage of debt obligations with the national budget and formulate guidelines for debt management policies;
g. Conduct regular debt portfolio reviews in order to recommend alternatives to help hedge against various risks and reduce borrowing costs, including participation in secondary debt markets;
h. Study and propose alternatives for debt relief, including debt conversion (swaps and others), to help reduce the external debt burden; and
i. Review and propose updates to laws and regulations pertaining to contracting external debt.

The Secretariat was composed of a senior macro-economist, who acted as the head of the unit. A monetary economist, with vast experience in the balance of payments and monetary accounts, supported him. Additional support included a fiscal economist to analyze budgetary interplay, an econometrician to develop alternative scenarios of debt growth, debt service and debt relief, a loan officer familiar with the modalities of international financial markets and new debt management arrangements, an information technology specialist responsible for implementing the latest IT tools and techniques needed to empower IT in better production of program outputs, and finally an attorney, with background in local regulations and international law, to advise on legal affairs.

5. Support for HLEC

One ultimate result of the DM&EM program was enhancement of the CBE debt management kernel, i.e., TS, which was established to act as the foundation for building a comprehensive debt management office that offered special support to the HLEC in:

a. Firming up and refining the country's future policies and strategies concerning debt and future external commitments that represented a considerable portion of the overall macro-economic strategy;
b. Weathering extended negotiations with the Paris Club, IMF, and the World Bank during the debt relief and re-scheduling processes;
c. Regulating and establishing a well-defined channel for borrowing, debt terms negotiation and debt status reporting through the CBE via a set of rules and regulations;
d. Successfully constructing the country's image in front of major creditors and international funding agencies;
e. Transferring Egypt from a heavily indebted, mismanaged,

haphazardly executed economy to a solid, well-supported and highly-coordinated one; and

f. Creating a sense of awareness and feasibility for efficient and effective borrowing through in-depth studies of past experiences in optimizing loan uses and defining pay back sources and mechanisms.

D. Debt Management System Used

As previously mentioned, DM&EM program management spent a considerable amount of time, effort and money in defining the symptoms of the malfunctioning external debt process and the needed prescription to cure the malfunction once and for all. Among the list of factors that needed GOE focus and effort was the debt management system to be used. In Appendix III-B, we have enumerated a list of twelve well-known debt management systems that were studied by the DM&EM program. Out of these systems, the UNCTAD DMFAS, chosen for its characteristics and flexibility, was deemed the best match for handling the complex Egyptian debt portfolio. It was still necessary for the DM&EM program team to accomplish the localization process (local system design, modification, arabization, and implementation). For this reason, we found it important to research, in depth, the UNCTAD system and present it in the following section.

1. Introduction and Background

a. Introduction

Improving the management of external debt has become an increasingly important objective of developing countries. Central to this task is the provision of timely, accurate and detailed data on external debt outstanding and on debt-service payments coming due. Among other things, the absence of such data hinders the formulation and

implementation of economic policy, leads to inefficient management of foreign exchange reserves, and increases the cost of borrowing in various ways.

UNCTAD provides the computerized DMFAS to assist governments in this task. It is a comprehensive management system for the registration, monitoring and analysis of external debt and other financial factors. Although the system is extremely powerful and flexible and has been implemented both on personal computers and in mainframe environments, the user needs little formal training or prior experience in the use of computers since easy-to-follow screen displays guide the user step-by-step in operating the various facilities of the system. The DMFAS was originally implemented in three language versions: English, French, Spanish and has now been modified by the DM&EM team to suit Arabic speaking countries.

The purpose of this section is to document the process of acquiring, modifying and implementing this system by the DM&EM program from the UNCTAD through a UNDP technical assistance project. It neither critiques nor discusses any of the modifications that took place in the 'ready made system' provided by the UNCTAD. It will present the principal functions, outputs and possible links to other systems, explained in Section D-2. Further details regarding the scope and the nature of data captured by the system are provided in section D-3. Procedures for implementation are dealt with in forth section of this chapter D-4.

b. Background

The debt monitoring system was provided to Egypt by UNCTAD through its Technical Cooperation Service (TCS), backstopped by the economists and electronic data processing experts of the Money, Finance and Development Division. So far, the system has been

developed and provided to interested countries free-of-charge in the context of technical assistance programs financed by the UNDP country programs. To date, UNCTAD has implemented its system in Argentina, Bolivia, Costa Rica, Haiti, Liberia, Madagascar, Malaysia, Pakistan, Togo, Trinidad, Tobago and Uganda.

As an organization, UNCTAD has 20 years experience in analyzing the full range of problems facing developing countries in their efforts to accelerate the development process. Its experience with computerized debt management systems also includes an intensive study of already installed computerized debt management systems. Since 1979, UNCTAD has been a regular participant in meetings of the Paris Club, in preparation for which its economists have come to know first-hand the strengths and weaknesses of debt management systems in a large number of countries.

Based on earlier analytical work, the current version of the system computer programs was developed over a period of about two and a half years, beginning in mid-1982, at UNCTAD headquarters in Geneva for five developing countries, which requested such assistance. Afterwards, the program management agreed, with other additional countries including Egypt, to incorporate further enhancement to the existing version of the DMFAS. It was completed in 18 months ending mid-1989.

2. Principal Functions and Outputs[16]

a. System Functions

UNCTAD's DMFAS is a computerized system designed to provide accurate and timely debt information for the purpose of debt

[16] DMFAS, Information Note, UNCTAD Secretariat, UNCTAD, Geneva, February 1993 (restricted distribution).

management. A pre-requisite for the provision of accurate information is the entry and maintenance of data in the DMFAS database. DMFAS has three modules: the DMS (Debt Monitoring System), the DRES (Debt Reorganization Subsystem) and the DPS (Debt Projections and Balance of Payments Linkage System). It also has an interface to the World Bank's Debt Strategy Module (DSM) and a function to report to the World Bank's Debtor Reporting Systems.

The DMS is the main module of the DMFAS, and most data used by the DMFAS is entered in it. Although some data must be entered independently by the user into the DRES and the DPS, these two modules also use data taken from the DMS (Figure V-4).

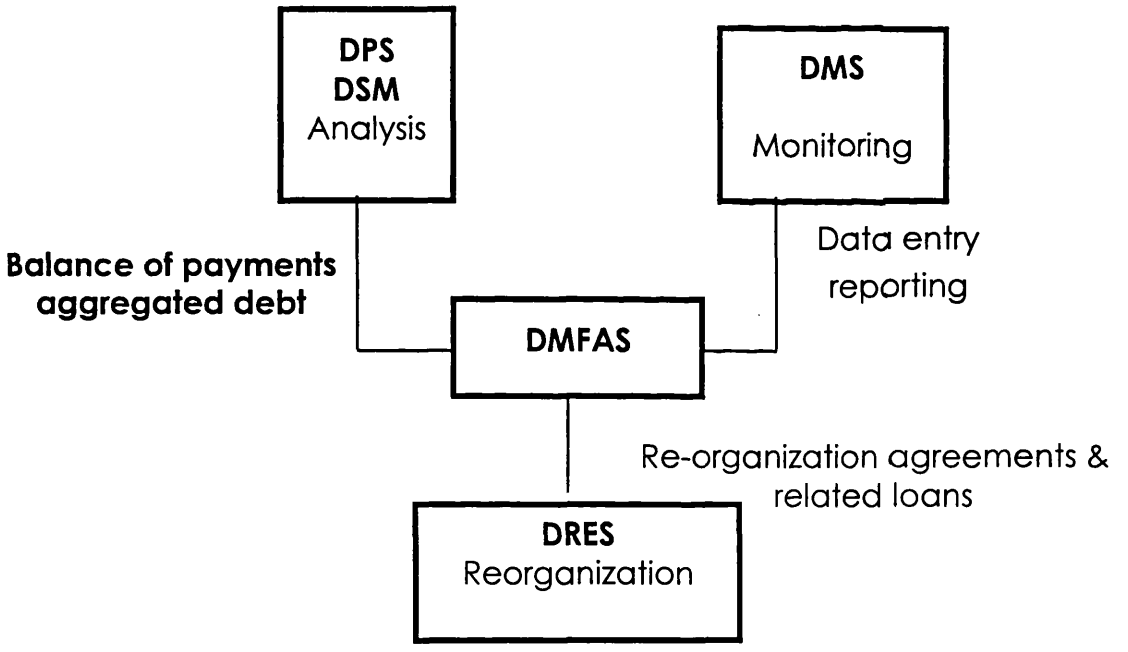


Figure V-4
DMFAS System Architecture

Debt Monitoring System (DMS)

The DMS module allows the user to follow medium-and long-term debt, both private, governmental and no-lending operations. The user may

also register short-term debt, domestic debt and grants within the system. The module is divided into two parts - Loan Monitoring and Project Monitoring. Loan Monitoring is used to provide reports on all data relating to general loan information such as loan terms, clients, related agreements, and loan transactions. Project Monitoring is used to provide reports on all data relating to projects.

To be able to produce accurate information, the user must enter the following data:

- The financial terms as specified in each loan contract;
- The characteristics of each loan;
- Information relating to loan participants or clients (borrowers, lenders, guarantors, beneficiaries, etc.);
- Historical balance and current transactions; and
- Interest and exchange rates.

The essential information describing the loan characteristics is registered through the use of codes which the user may modify at will. Once entered, the data may be updated regularly or deleted, as the case may be, by means of DMS commands. Various safeguards have been put into place to protect reference files and data entered by the user.

Efficient data entry requires careful completion of several forms provided along with the DMS for data collection. To facilitate the user's task, the DMS menu structure follows the same formatting as the forms used for data collection. The DMS module automatically calculates amortization tables based on the information entered into the database. Numerous reports are then available, the most important ones given below:

- Projections for future disbursements and future debt service;

- Reports on exact debt status at any time, such as debt outstanding, arrears outstanding, or disbursements and debt service during a particular period, estimated penalty interest;
- Reports to the World Bank's Debtor Reporting System;
- Exchange rate variation reports which shows the effect of currency fluctuations on outstanding debt and, on net flows as well as the global effect;
- Reports showing the penalty interest stock and penalty interest flows;
- Reports on the stock of arrears and the estimation of penalty interest to be paid; and
- Reports on the comparison of theoretical and ledger stock.

Report formatting is left to the user who may select the output criteria. The user can easily produce a statement or a projection for the entire loan stock, a particular creditor country, a specific lender or a given beneficiary. The statistics produced by the DMS may be presented at the level a loan, or aggregated as a function of one or several criteria. Subsets of data can be saved on disk and used by other institutions, when required. A spreadsheet facility allows data to be down loaded from the DMS to generate reports, which can be formatted to the user's needs.

Debt Re-organization Subsystem (DRES)

The Debt Reorganization Subsystem facilitates a country in its preparation for both the Paris and the London Clubs, namely when government and / or commercial debt, respectively, are re-negotiated. The DRES uses data from the DMS to permit the user, after debt re-negotiations, to establish the relationship between the reorganized (old) loans and the reorganizing (new) loans (UNCTAD,1993). Concluded agreements can be registered in detail in

the subsystem.

More specifically, the DRES module allows the user to:

- select eligible loans for reorganization:
- facilitate recording of reorganizing terms received;
- facilitate identification of reorganized transactions; and
- automatically update ledger accounts with reorganized transactions and their corresponding disbursements.

Debt Projections and Balance of Payments Linkage System (DPS)

The Debt Projections and Balance of Payments Linkage System is an analysis tool designed to combine projections obtained from the DMS with various projected scenarios of the balance of payments, which are calculated regularly. This allows policy makers to review their existing debt strategies depending on the prevailing economic situation. More specifically, the DPS module allows the user to:

- study the impact of new loans on the aggregate debt profile;
- analyze the effect of debt rescheduling based on different hypotheses; and
- combine debt data, aggregated as required for the particular analysis, with various balance-of-payments scenarios.

The DPS can run scenarios on the ways in which balance of payment gaps can be closed with additional borrowing and on the corresponding effect on future balance of payments. Automatic calculations are based only on external debt data.

Debt Strategy Module (DSM)

The World Bank's Debt Strategy Module is an analytical tool for developing and testing scenarios for the efficient management and

financing of a country's external debt. The DSM is interfaced with the DMS so those user defined loan groupings from the DMS can be used to classify loan data for subsequent analysis in the DSM. The DSM allows one to test various debt strategies in the context of a country's prevailing macro-economic conditions, in order to choose the most appropriate strategy to deal with its debt.

b. System Outputs, Calculation & Linkages to Other Systems

Outputs

In addition to the reports which may be prepared by the flexible report preparation program and the programming of balance-of-payments and debt-service data provided by the DPS, the system produces 23 pre-programmed reports which can be grouped as follows: registration reports, accounting reports, user-requested reports and reference file reports. The system also provides a browsing facility for reviewing data directly on the computer screen (UNCTAD, 1993).

On the complementary side, to make it more interactive, the DM&EM program team developed a solid shell that was used to generate the different scenarios in response to inquiries by users. This was in addition to their efforts in arabizing a large portion of DMFAS itself.

Automatic calculations

An important feature of the DMFAS is its ability to relieve the user of the burden of calculating debt-service schedules and average terms for groups of loans. In manual systems, the difficulties involved in performing these types of calculations, which are essential to cash flow management and for establishing guidelines on terms for new borrowing, prevent their use. Those calculations that are performed quickly become obsolete when conditions change in international financial markets.

In calculating schedules of interest payments, repayments of principal

and schedules of other charges, the DMFAS takes into account variable interest rates, and changes in the interest rate base, and in the margin over the base interest rate from one sub-period to another. Programming is always done in the contractual currency of payment, and multiple currency loans can be accumulated by the system. Changes in exchange rates are taken into account in computing debt-service schedules in a common currency. These features may be used to generate hypothetical debt-service scenarios based on future evolution of interest rates and exchange rates.

Debt-service schedules may be calculated either on the basis of total commitments or on only disbursements that have actually been made. Amortization schedules may be calculated according to several different methods. When disbursement schedules are not known with a high degree of certainty in advance, the user may choose from among several possible patterns for his automatic calculation. Regularly recurring charges are also calculated by the system.

The terms of loans, which have been rescheduled on the basis of a multilateral agreement, can be used to automatically generate the debt-service schedules for loans that were rescheduled and to revise the schedules for the portions not subject to rescheduling. For analytical purposes, DMFAS can calculate the following characteristics of the entire loan stock, groups of loans, or individual loans (when appropriate):

- average interest rate over the lifetime of the loan;
- average margin over the base interest rate over the lifetime of the loan in the case of floating interest rates;
- the interest-rate equivalent of charges over the lifetime of the loan
- the average grace period;

- the average maturity period; and
- the grant element[17].

Linkage to other systems

The reports and outputs described above may be used as input for a number of other management activities, such as the following:

a. Programming of debt-service payments by currency and their payment dates together with programming of other balance-of payment items by means of the DPS can serve as input for the preparation of foreign exchange budgets.
b. The data on transactions captured by the ledger module can be re-formatted as input to formal accounting systems maintained by various agencies, such as multi-currency accounting systems often maintained by central banks.
c. Data on individual development programs financed by external loans and grants together with information on local finance and allocation of expenditures by major category, etc., can be supplied to the development planning authority as input to a system of program monitoring.
d. Data on agreements pertaining to the re-lending of the proceeds from an external loan by a government agency or designated bank to other domestic entities can also be captured by the DMFAS for purposes of facilitating recovery of debt-service payments arising from the re-lending agreement.
e. The DMFAS is also designed to support periodic reporting to the World Bank, matching its format, on a magnetic media (UNCTAD, 1993).

[17] Debt Management and Economic Monitoring Program document, IDSC, Cairo, 1987.

c. Report Generation

Improvements to the original version of the DMFAS were needed for Egypt to produce all of its printed reports (for detailed listings of these reports see Appendix V-A, section B). It should be noted, however, that entering all historical transactions for each individual loan from its date of signature, significantly added to the time allocated to load the system with the required data. It was recommended that cumulative historical transaction balance for each loan as of the end of the fiscal year, and individual transactions only from that date onwards be entered to the system. At the end of each year, these data are (i) added to the cumulative historical transactions, and (ii) transferred from on-line storage to a computer tape for permanent storage.

3. Data Characteristics

a. Data coverage

DMFAS can maintain data on up to ten thousand loans[18] or grant agreements for each of the following categories:

- Grants from abroad;
- External medium and long-term public or publicly-guaranteed debt;
- External medium and long-term private non-guaranteed debt;
- External short-term debt of the central government (individual loans);
- External short-term debt of the State (summary loan accounts); and
- Domestic on-lending.

Information on the terms and characteristics of each loan is entered into the system from the loan agreements and associated

[18] As stated in the DMFAS literature held at the DM&EM program.

documentation. Subsequently, data and dates on all transactions are also entered. In respect to short-term debt, principally commercial debt, data is collected in the form of changes in balances and cumulative transactions during specified reporting periods for certain broad categories of agreements.

b. Types of data

DMFAS was designed to record detailed data on:

1) Financial data, interest rates and exchange rates

a. Data on the financial provisions of loan agreements is collected primarily for the purpose of programming disbursement and repayment schedules. It includes the amounts and currencies of the total commitment, currency of repayments, dates of first and last disbursements and repayment of principal and their amounts, disbursements and amortization profiles, and periodicity, whether in currency or in kind.

b. Data on commissions and other charges includes the nature of the charge, the beginning and ending dates for the calculation of regular charges, their periodicity, and whether data is known or estimated.

c. Data on interest rates which may be fixed or variable, includes information on up to three interest rates or three margins over the base interest rate. It could be applied during different sub-periods which could be options during the same period. Data is entered on the dates for beginning the calculation of interest payments as well as actual payments dates. Similar information is collected on penalty interest rates, as well as which rate is applicable to arrears on principal and which on arrears of interest payments. Data for a large number of exchanges rates and for interest rates used in floating-rate loan agreements are maintained in separate files (UNCTAD, 1993).

2) Descriptive and control data

DMFAS provides a multitude of descriptive and control data pertaining to each agreement. For control purposes, dates may be recorded for:

- loan authorization,
- loan signature,
- loan effectiveness, and
- last date of loan availability.

Descriptive data includes clients associated with each loan, the relationship of each client to each loan, the shares of multiple lenders or guarantors in each agreement, loan category, agreement type, economic sector, loan purpose and national budgetary relationship. Additional data on each client is maintained in a separate file. These data include the institution type (official, private, bank, non-bank, etc.), country of residence and, optionally, mailing addresses and telecommunication information.

When loans are related to specific economic development programs, data is sorted in a program file. Information in the program file may include, at the option of the user, the following: location, economic sector, program manager, starting year, duration, allocations by major expenditure categories, original and revised estimates of total cost, including local and foreign financing components, and the relationship between the program and one or more grant or loan agreements.

3) Data relations

Individual loan agreements are often related to other agreements. For instance, loan agreements pursuant to a multilateral debt rescheduling agreement are related to the multilateral agreement itself and to each of the original loan agreements, which were re-negotiated. Similarly, frame agreements typically give rise to several individual loan

agreements, and the proceeds from external borrowing are often used for re-lending domestically, which gives rise to parallel agreements. A powerful feature of the DMFAS is the debt relations file, which are related to one another (IDSC – DMU, 1993).

c. Data capture and entry

When received by Egypt, DMFAS was already designed to capture almost all data elements referred to in the specifications. Subsequently, the following were also included:

- Financial flow codes (grants, public and publicly-guaranteed loans, private non-guaranteed loans, short-term loans, domestic loans, etc.);
- Institution codes for debtors, creditors and other parties to a loan agreement (public, private, bank, non-bank, foreign affiliated, etc.);
- Loan / client relationship codes, including many more relationships than creditor, debtor and guarantors;
- Separate loan purpose and program purpose codes in addition to economic sector codes;
- Inter-program purpose codes, to distinguish program allocation by purpose (feasibility studies, site clearance, construction, imports, etc.) (IDSC – DMU, 1993).

At the time of installation DMFAS already includes a development program subsystem that allow for tracking several programs financed by a single loan as well as the allocations from a single program. The only feature, which still needs to be added to the system, is capturing of data elements on disbursements by program. If this is done, amounts budgeted to each program annually should also be added so as to compare actual with budgeted expenditures. Moreover, data entry is already fully interactive and includes error checks and error messages.

DMFAS also provides the ability to check for the internal consistency of some of the data entered on loan terms. The system can accommodate a large volume of transactions on the order of 24,000 per year or 100 per day. Peak load problems arise toward the end of calendar quarters which necessitate the need for batch processing alternatives to the normal interactive data entry procedure (UNCTAD, 1993).

4. Implementation

Preparation for data entry

To provide an easy and uniform way of entering data, a set of standard forms, together with instructions for their completion are provided with the system. Because interactive screen displays were closely related to the forms, their use, especially for loan term data and descriptive data relating to loan agreement, is virtually obligatory. Transaction data, on the other hand, may be entered by means of a "payment order" form provided with the system or directly from payment vouchers or debit and credit memoranda. The information content of these forms, presented in Appendix IV - A, is specifically designed to satisfy the reporting needs of a sophisticated debt monitoring unit. Although most of the data for which provision is made was required for reporting to the World Bank, some of it was optional and these features did not need to be implemented immediately. Examples of functions that were implemented later are: development program monitoring; recording of client mailing and telecommunications; monitoring of private sector debt; and short-term debt and re-lending agreements.

The time required installing UNCTAD's DMFAS software on a microcomputer is a few hours. Mainframe implementation usually takes up to one week. The time required for loading all of a country's specific

data into the DMFAS depend greatly on the number of loans that a given country have. Another important factor is the status of the present "manual" system. The better-organized present procedures are the shorter the time that is spent on data entry. Users familiar with the system can enter data on about 20 to 30 loans per day. Before data entry can be undertaken, however, completion of three major tasks is necessary:

1. complete a loan terms form for each existing loan agreement;
2. compute loan balances on all existing loans by an agreed cut-off date; and,
3. assemble all ledger transactions that have been effected since that date.

These tasks can easily take as much as one hour per loan (Izzat, interview - 1993).

5. System Arabization

At the time of implementation in the DM&EM program in Egypt, the DMFAS data base subsystem, written in COBOL, was already available in three language versions: English, French and Spanish. Several features of the system facilitate the preparation of different language versions. One of these is the use of a separate text file for storing the text used in the screen displays. Thus text could be changed without modifying the computer programs. Secondly, a data dictionary is stored in another independent file. Codes entered by the user are checked for validity against the entries in the data dictionary. Thus labels for numeric codes can be altered easily without significant program modifications. Thirdly, data entry does not make use of cursor control keys but, rather, data are entered by the "pair value" method. The menu selections or data fields in the screen displays are provided in numbers. Menu selections are made, or data entered, by entering first

the number of the selection, followed, if appropriate, by the data to be entered. These features, in addition to Egyptian expertise inmodifying the main kernel, contributed to successful arabiztion of the DMFAS system.

E. Conclusion

Effective external debt management can be facilitated by a few, well-selected players and the establishment of a coordinating body (such as the Central Bank). Additionally, it requires the composition of a group of high government officials responsible for the overall economic reform program reflecting government commitment to full debt management functions. This would permit the development of policy guidelines on the national external debt, the screening of proposals for new borrowings, the design of debt re-negotiation programs and the monitoring of overall developments.

A debt management program's success depends to a large extent on the reasons behind initiating it, its objectives, phases, scope, management approach, challenges faced, main users and targeted beneficiaries, deliverables and outputs, and, most important of all, its top management commitment, support and approval.

A well-established debt management program is heavily dependent on a robust debt management system. The debt management function is country specific, i.e., it cannot be copied as is from one country to another. In that respect, a debt management system needs to be country-specific if its principal functions and outputs are to satisfy its needs. Proper implementation, ease of use, flexibility of maintaining and updating, in addition to good training for staff using the system, are critical success factors in this area. The above key landmarks present the basis of our hypothesis and guide the process of our research for this thesis.

Chapter VI

Analysis of the Egyptian I/DSS Debt Management Program

A. Introduction

This chapter provides a comprehensive analysis of the Egyptian I/DSS debt management program. The findings are divided into qualitative and quantitative perspective analyses that tackle the impact of the program from different angles. For the qualitative analysis section, we analyzed the impact of the program from the political, functional, and managerial perspectives during the different phases of the program.[1] The perception and views are a result of the research conducted on 10 different sample sets that are characterized by being from different levels of decision makers[2] who represent a variety of program users, supporters, and managers together with several key personnel in the DM&EM program team. Findings were analyzed in light of the theoretical foundation laid for this research covered in Chapter III, and the causes and symptoms of the problem, i.e., deteriorating conditions of external debt management, covered in Chapter IV.

For the quantitative analysis section of this chapter, we analyzed major national and international economic perspectives and views that have had a direct impact as a result of DM&EM program implementation. This analysis reflects the views of several reputable financial institutions

---

[1] DM&EM program phases :

1. Initiation and Base-Building Phase, late 1986 till late 1990. Its characteristics and are fully presented in Chapter V, Section B.
2. Institutionalization Phase, early 1991 till early 1995. Its characteristics and are fully presented in chapter V, Section B.

[2] Including the Egyptian Prime Minister, Dr. A. Sedki; Deputy Prime Minister and Governor of the CBE, Dr. S. Hammed; Minister of Administrative Development, Dr. Ebied; Minister of Economic Affairs, Dr. Ghali; Minister of International Cooperation, Dr. M. Makramala; Chairman of the Cabinet IDSC, Dr. H. El Sherif; Executive Manager of the Cabinet IDSC, Dr. A. Nazif; Director of the Cabinet IDSC Decision Support Department, Dr. M. Kattab; DM&EM National Program Director, Dr. M. Kaddah; and CBE - LEDD Director, Mr. E. Ezz.

on how they perceive the improvement in the Egyptian economy to date.

It is worth mentioning at this point that the accelerating economic gains realized by Egypt during the past few years are a result of a comprehensive economic reform program the solid base of which is the DM&EM program (Figure VI - 1). Such a base was a necessity and a logical demand if a powerfully emerging economy was to have a solid foundation. It was the one key factor that drew international creditors and financial institutions back to Egypt after a threatened boycott during the mid-1980s (the period when it was deiced that Egypt should participate in Paris club negotiations).

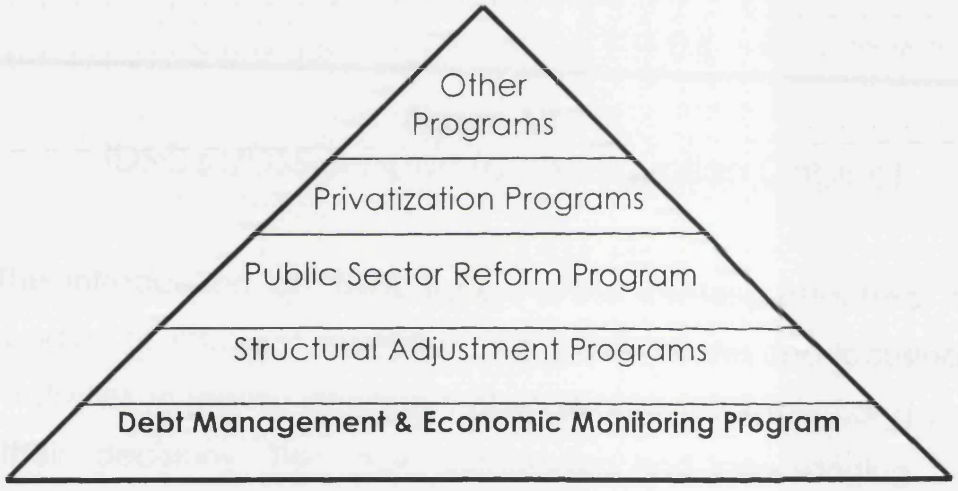


Figure VI - 1
Egyptian Economic Reform Program

One critical factor that contributed to the success of the DM&EM program was the timely inception of the Cabinet IDSC in the mid-1980s. The reasons behind this being a key success factor are the following:

a. Parallel and equally important projects and programs were being developed and implemented by the Cabinet IDSC in other sectors of the government, the success of which were key to the realization of the DM&EM program (Figure VI - 2).

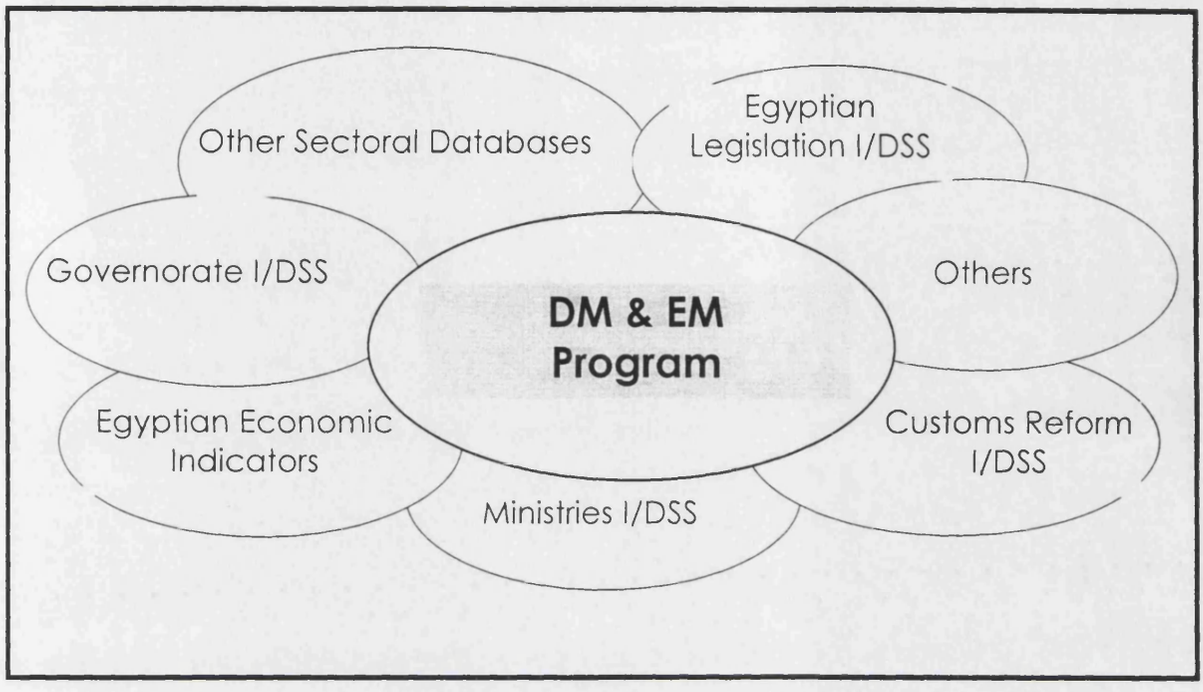


Figure VI - 2
IDSC's I/DSS Support for the Egyptian Cabinet

b. The introduction of "think tanks" (I/DSS centers) attached to the bodies of different ministries and governorates and focusing their activities in serving decision makers through leveraging and shaping their decisions. This new conception had long ranging cultural effects as regards to perception of users and system implementation teams as well as the working environment they operated in.

This chapter will touch on the challenges faced by the Cabinet IDSC, and how it met these challenges and will analyze their effect on the success of the DM&EM program.

B. Qualitative Perspective Analysis

The comprehensive empirical evidence gathering techniques and methods used in studying the DM&EM program revealed a number of findings and conclusions on the experience of adapting, adopting and diffusing I/DSS in a national context. This section covers our political, functional, and managerial perceptions and views about the DM&EM program during its development phases, i.e., initiation, base building, and institutionalization phases. These views will lead to the identification of the research findings and conclusions covered in Chapters VIII of this thesis. The perceptions, coupled with the concepts and theories covered earlier, confirm the importance of the findings, generalizations and proposed areas for future research.

1. Political Perspective

The political perspective analyzes the factors and conditions that led to realization of the DM&EM program. These factors include, top level decision makers commitment, change in the decision making process, change in the debt acquisition process, change in the roles and responsibilities of involved institutions in the external debt management process, change in organizational structure and dynamics, and user involvement in the program. The phased political perspective impact could be viewed as follows: -

a. Initiation

During the Initiation Phase (from early 1987 till mid-1989), the DM&EM program suffered from a lack of political commitment. The reason behind this was the lack of clarity of the uses and benefits of the I/DSS in the absence of proper computerization and basic information infrastructure. Lack of user understanding and awareness also greatly contributed to this problem. The decision making process prior to this

phase was a long, haphazard and undefined process that was difficult to study or generalize. There was no defined pattern followed or enforced; the process was basically dependent on an individual decision maker's background, experience, and management style. Top level strategic decision makers heavily depended on advisors, specializing in different fields, for studying, analyzing and recommending solutions. The practice of relying so heavily on advisors was characterized by two main problems: very theoretical recommendations being made due to the fact that most of these advisors were university professors and possibly inexperienced in actual practice; lack of coordination and global planning among the various advisors. The result was consistently poor, contradicting, overlapping and low quality information. The nature of the recommendations was insubstantial and uni-directional, i.e., there were a limited set of scenarios that could be presented mainly because of the lack of tools and reliance on a "trial and error" advisory pattern (Kattab, interview - 1993). At that time, decision making concerning management of external debt was even worse. Egypt did not posses a structured procedure for borrowing agencies to follow, nor a central coordinating body, which could have objectively set external borrowing guidelines.

This complex arrangement was not conducive to efficient external borrowing. The lack of a central and active coordinating body, involving the participation of the highest government authorities, led to a failure in developing a long term financing strategy and, in turn the development of a foreign borrowing process.

Furthermore, the structural rigidity, and poor performance of several public sector organizations with large external debt and several foreign loans contracted under inappropriate terms compounded the magnitude of the debt problem (Hammed, interview - 1993). In this respect, we discovered that, in the past, debt decision makers

performed debt management functions solely to satisfy creditors and / or lenders to respond to external pressures from financial institutions such as the World Bank. The reason for this was that, in order to acquire additional funds, Egypt had to appear as if it was regularly performing full debt management functions.

A major turning point was realized when the HLEC was invited by program management, headed by the Cabinet Minister for Administrative Development, for a presentation[3] of DM&EM program capabilities, outputs and deliverables. It was a demonstration of how this tool could be useful for supporting, leveraging and shaping decision making in a national context (details are fully presented in Chapter V, Section B).

b. Base Building

The Base Building Phase (from mid-1989 till late 1990) was characterized by an escalation of interest and almost full commitment from the HLEC, a direct result of the successful program presentation and the demonstration of its output during the above mentioned January 1987 meeting. The DM&EM Program team together with the Minister of Cabinet Affairs for Administrative Development and the Governor of the CBE presented their case in an ingenious way. The supply driven, touch and try, prototyping style of the demonstration attracted many high level users. Securing top level decision makers' commitment was in itself a major goal of the project team since it helped in securing much needed support and resources for the program and its charter top/down approach. In addition, securing the interest and support of the highest levels of the constitutional authorities (the President and Prime Minister) helped protect the program from a lack of coordination. Clear, concise guidelines could then be developed for

[3] Took place on the Cabinet premises in January 1987.

all institutions involved in the debt management process.

During this phase, an overview of the program and its objectives, goals and achievements were highlighted. It witnessed a clear vision of what needed to be achieved and the method to employ to achieve it. The vision and strategies were translated by the program team into specific objectives and goals. A considerable amount of time, effort and money was spent on studying other international experiences. At that time the IMF, UNDP and the UNCTAD were invited to lend technical assistance in the area of debt management to support GOE initiatives. They were selected from a list of technical assistance agencies that provided this advisory service, but were specifically chosen based upon their experience under similar conditions in developing counties, i.e., complex debt stock situations in a deteriorating economy "SILIC" (severely indebted low-income countries) country.

During this phase, high level political commitment began to yield a more I/DSS culture-rich decision making environment with a decrease in the number of lower managerial positions resisting change and in the number who were not interested in cooperating with the program (El Sherif, interview - 1993). The decreasing level of resistance to change helped in the re-design of various roles and responsibilities within the CBE-LEDD (presented in detail in Chapter V, Sec. C) specifically and in other involved government institutions in general (Hammed, interview - 1993). In our opinion, this new positioning of the involved parties in the external debt management process under one umbrella would not have been realized without firm political commitment and encouragement from top authorities regardless of the changes in personnel and positions of ministers, top decision makers and / or governments.

c. Institutionalization

The Institutionalization Phase (from early 1991 till early 1995) was characterized by evaluation of overall program objectives and goals, what had been achieved, what had not been achieved, and how to improve the program. Unlike many I/DSS programs in the literature in general and implemented by IDSC specifically, the feasibility of the DM&EM program was apparent by the end of its Initiation Phase. It was during this time period that the first Paris Club negotiation rounds for Egypt were held during which the prototype of the debt management I/DSS (consisting of a full database of loans and their accompanying detail) was used. According to the Governor of the CBE, ".. the savings realized for one day of debt service payment for the Egyptian debt stock would pay for the entire program". (Hammed, 1993)

In commenting on the program, President Hoseny Mubarak said: ".. before this we used to receive interest and principle payment claims from any creditor claiming a certain amount and we would directly pay without any validation and / or cross-checking. Now, the government has the information vehicle and the support mechanisms which enable it to survey all our external debt and obligations towards creditors in minor detail and to the cent. We have requested the government to continue these efforts and build on this experience by utilizing the information to develop complementary tools which will allow the country to manage its future borrowings with a developed and more advanced macro-economic perspective...".[4]

With a clearer vision of the program by both users and program managers, increasing political support, and more user involvement, program enhancement was realized which led to production of a clear external debt acquisition and management framework that included

[4] CNN Interview with President Hosni Moubark, Egypt, July 12, 1991.

specific guidelines for roles and responsibilities for involved agencies and institutions. It is worth mentioning that top level commitment was not deterred by failures that sometimes faced the program. Top level supporters rationalized that a certain amount of failure was inevitable while the program team gained knowledge of debt management, a newly developing field that had no text books to follow (Ebied, interview - 1993). They regarded such false starts as an integral part of the learning process for the DM&EM program team. The emphasis of the program then shifted from problem solving to problem avoidance in an effort to effect economic development in the country. In a sense, top officials perceived the debt management program as the cornerstone for economic reform. It focused on avoiding future problems and burdens at both the economic and social levels, It devised and supported the mechanisms and the systems that not only looked at the past but zoomed in on the future, forecasting and anticipating problems and setting the groundwork for dealing with them (Sedki, interview - 1993). The above factors led to a major change in institutional structure and in prioritizing institutional functions that directly affected institutional management of foreign debt.

2. Functional Perspective

The functional perspective analyzes the adaptation, adoption and diffusion factors that led to the realization of the DM&EM program. These factors look carefully at technical versus conceptual I/DSS, application of I/DSS use, context of I/DSS use, issue-based I/DSS, localization and other related I/DSS issues. The phased functional perspective impact could be viewed as follows: -

a. Initiation

During initiation period, the functional perspective factors were very much supported by the political ones. That is to say that the early

political support for the program directly affected the functional factors that, in turn, affected the inception and realization of the DM&EM program. However, program supporters, builders, implementors and managers were constantly faced with the challenges of continuously adopting appropriate state-of-the-art technologies (requiring continuous exposure and search for new technologies) in addition to working on adapting the program to the Egyptian decision making "cultural interface" (modification to match context of use in addition to arabization) and finally, in diffusing it to the working society in an attempt to make it the default working standard (via continuous training and practical use by the work force).

In our opinion, the I/DSS's initial entry was successful[5] due to the fact that its implementation was simple and user-friendly employing simple tools such as spread sheets and databases that were supported by timely and accurate data and dependable qualified and dedicated staff (Kaddah, interview – 1993).

b. Base Building

The base building period witnessed a more in-depth functional analysis of requirements and user needs, translating them into functional I/DSS systems and procedures and testing them out for proper adjustment and implementation. Sub-systems (see Chapter V, Section 10) were developed for contextual applications that both addressed proper use and satisfied local needs. Unlike the corporate I/DSS application, DM&EM I/DSS application was characterized by being more "issue – based", addressing semi-structured and ill-structured issues (El Sherif,

[5] More than 70 % of our researched sample set have indicated that they decision making process and style of management has been affected by the DM&EM program realization and that it became an integral part of their work processes. Physically, we have seen such top police/decision makers creating physical locations for their I/DSS support team in addition to funnelling most of their decision support needs through such unit.

1988). It was a unique development by local experts who found very little data on similar I/DSS applications to study (El Sherif, interview - 1993). In addition, localizing the UNCTAD system (the DMFAS[6]), in terms of adapting it to local context (Egyptian debt stock structure and terms) and enforcing local cultural interfaces (arabization of screens and outputs), represented a great technical challenge (Kaddah, interview - 1993). Table VI -1 contains an outline of strategies used in tackling these problems.

Table VI - 1

Examples of Contextual Fit Improvement Strategies Used by IDSC / DM&EM Team[7]

Description	Effects
Two-Tiered Teams IDSC / DM&EM design teams include two types of members: one who is technically competent (typically a young college graduate) and another who is fully experienced with the bureaucracy (an older person with government experience.	Bridged translation gap between I/DSS builders and typical bureaucrats whose inputs are sought and needed. Improved communication and minimized risk of technical failures.
Reverse Distributed Processing Approach for developing technology infrastructure that started with islands of personal computers, linked them together, built a network infrastructure, and finally added a mini-computer.	Bridged user-technology gap and allowed accelerated implementation of applications. There are now 35 PCs and a data network of national nodes at the CBE and various ministries.
Arabization of Software Linguistic and cultural adaptation of user interfaces to the Egyptian decision-making environment.	Bridged user-application gap. Custom applications and many standard tools (such as DBase III, Lotus 1-2-3, FOCUS) are fully arabized. Bilingual (English/Arabic) electronic mail in beta test.
Chauffeured I/DSS Use Use of staff intermediaries for supporting senior policy makers rather than having him or her directly on-line.	Kept focus on providing support for strategic decision making rather than draining IDSC / DM&EM resources in supporting non-strategic office applications.

[6] Discussed in detail in Chapter V, Section C.

[7] In part from El Sherif and El Sawy, 1988

In our opinion, the success of this phase was very much dependent on the qualified staff who were created through continuous training and exposure to the international arena. Additionally, top management support and acceptance of the continuous modifications and changes, due to the rapid growth and changes in the I/DSS field and the adoption of the fast delivery prototyping approach to system design, contributed a great deal.

c. Institutionalization

The functional perspective of this phase meant to address more fine-tuning of the needs and further adjustments to the contextual issues. It tended to shift from supporting individual issues and inquiries to more global policies and external debt strategies. This level of maturity came as a result of many alterations and refinements to the system. As a result, the DM&EM program started to shift from being just a program to becoming a fully fledged debt management unit fully institutionalized at the CBE - LEDD (early 1994). Over time, the unit became an integral part of the CBE and represented the heart of the country's external debt management operation. Figure VI - 3 represent our view of the Egyptian Debt Management Unit (DMU) institutional positioning and functional role.

Moreover, during this phase our research shows that the major concern of top policy and decision makers was the future continuity of this program. This concern was aimed at subsequent and complementary phases that needed to be developed following the same path and employing the same critical success factors. We agree to their characterization of the impact and gains[8] from the DM&EM program as a good solid foundation for a full economic reform program, but it is

[8] Presented in detail in Section C of this chapter.

not enough. We agree that institutionalization and sustained growth of such a program and, in turn, the DMU, is very much linked to developments in areas like debt strategy modules, further enhancement of the I/DSS, enrichment of DM&EM program outputs and deliverables and widening of the scope of coverage to include internal debt, for example and usage. Additionally, developments in the field of financial and capital market systems, as well as other related balance of payment and trade balance systems, is a requirement. Ultimately, the networking of these systems and their integration and transportability to each other will represent the utmost economic goal of this program (Sedki, interview - 1993).

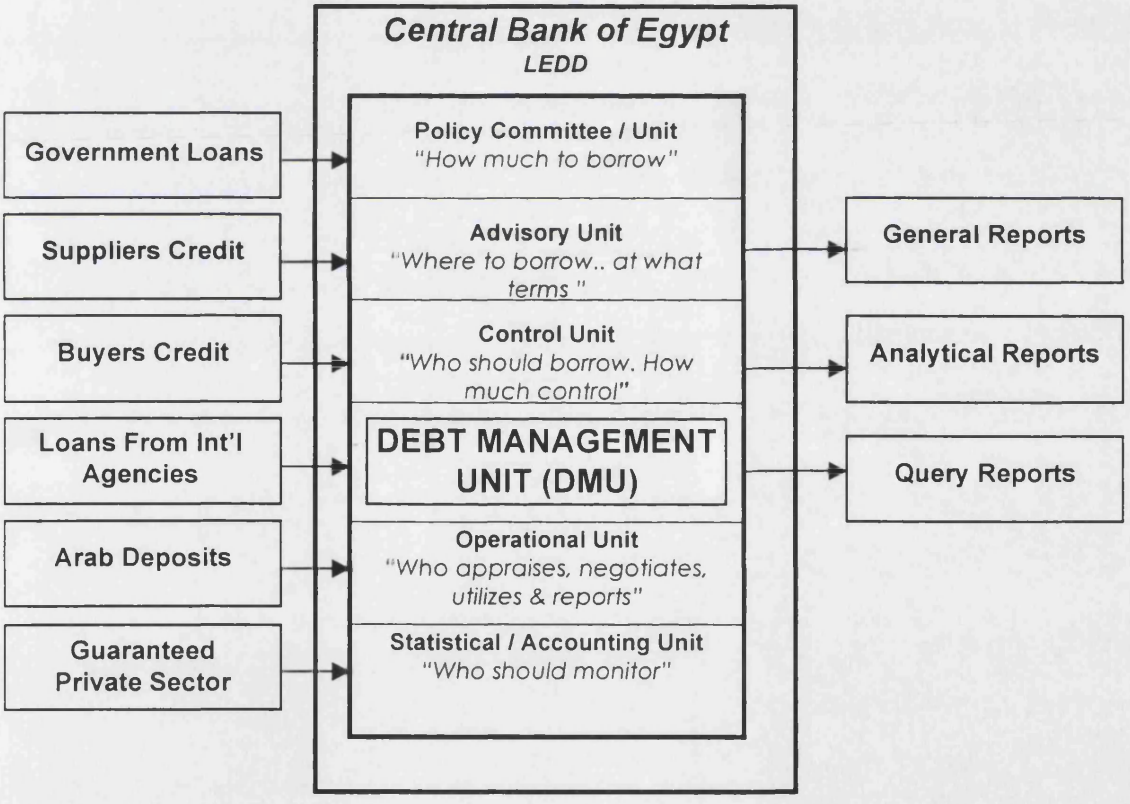


Figure VI-3
Institutional and Functional Role of the Egyptian DMU

(For more details about the DM&EM program and DMU focus, please refer to Appendix VI – B.)

3. Managerial Perspective

The managerial perspective analyzes the different project management factors that affected the inception and realization of the DM&EM program. Such factors address management style, recruitment, human resources development and training patterns, plus other project management related issues, in light of the program phases. The phased managerial perspective impact could be viewed as follows: -

a. Initiation

Though the initiation period has witnessed considerable political support and commitment, program management faced the classic problem of trying to implement a technology-based program, dependent on timely information and expertise in both I/DSS and debt management, in a typical government bureaucratic environment burdened with unskilled, less experienced, under-paid and almost untrained employees. Faced with this poor working environment; inability to recruit from outside the government sector (as long as the government possessed the needed human resource); lack of resources, as well as the means[9] to pay market salaries and benefits, the program faltered seriously during its inception. Though the Cabinet IDSC, which does not follow the normal government rules and regulations in recruitment and salary structure, was involved from the beginning of the DM&EM program, they represented the I/DSS technology section only. This part of the program was very trivial compared to the contextual section, i.e., the debt management and Egyptian debt stock experience represented by the CBE - LEDD staff.

[9] According to Egyptian law, government employees cannot work in two jobs at the same time and there is no way and means to pay them more than the salary and incentives contained in his contract, which is usually low.

These severe constraints, the presentation to HLEC in January 1987 and the pressing deadline for the first Paris Club negotiation round, prompted the Minister for Cabinet Affairs for Administrative Development to secure a consensus from the HLEC, and in turn the Cabinet, on abolishing many of these constraints, at least for such critical programs. This significantly revived the DM&EM program, and its management started recruiting high caliber staff, paying them market-based salaries and incentives in addition to planning their organizational careers. In the meantime, program management's focus was on building the main debt database that consolidated all the previous attempts at computerizing the debt stock, in addition to securing all possible details on loans, their terms, and their status. This was a massive coordination, collection, buildup and refining effort (Ezzat, interview - 1993). Finally, according to Mr. Khaled El Sayed[10], "..during the 1991 Paris Club negotiations we were sitting in one place and our creditors in another and there was a runner who carried messages between us. We were required to respond immediately to any proposed suggestions or alternatives in a matter of minutes (15 - 30 minutes approximately) accept or refuse. What was being proposed might be a golden opportunity which, if accepted, would be a great achievement, and, if not, might be a great loss. The opposite was equally true, if the proposal was not as good as it might appear. Without the powerful I/DSS capability that we had, it would have been next to impossible for any human being to study, analyze and compare the feasibility and impact of any proposed solution. Prior to this, we did not even have the capability to compare, check and contrast our debt figures and terms with other creditor countries. Moreover, we had reached the level of not only studying and analyzing but modifying

[10] Mr. Khaled El Sayed is the senior technical project manager who was nominated from the CBE-LEDD and trained by IDSC.

and convincing creditors that different scenarios might better suit both of us and would accomplish almost the same goal. Furthermore, several reports were published after the negotiation rounds describing our systems, especially the database, in which it was described as the "Cream of the crop" due to its comprehensiveness and accuracy. Others, such as the resident advisor of the IMF, described it as being a "Clear" database, i.e., error free, where its outputs are 100 % correct and its reliability uncontested."[11]

b. Base-Building

This period of the program reflects our analysis of findings on the implementation of the DM&EM program as well as on the use of I/DSS when faced with typical project management challenges. These challenges include:

Management Style: The early involvement of the cabinet IDSC had a positive impact on the success of the DM&EM program in that its role was important with regards to managerial and organizational aspects. These aspects were related to spreading awareness of the concept of I/DSS, establishing a human and technological infrastructure capable of realizing the mission and objectives of the program, and training the program team to operate in crisis management mode, if required. In spreading awareness, the IDSC depended on a series of presentations and training courses for different users, supporters and program teams in which was explained the mission, objectives, importance, benefits, output, and other aspects of the DM&EM Program specifically and the I/DSS culture in general. Additionally, and with the help of the IDSC, the DM&EM program periodically organized high level expert meeting /

[11]Quoting Mr. Abou El Ezz, " ... I can show you letters between several creditor countries and us, which moved back and forth between us for six months, as we debated and argued about debt figures and terms and in the end they were convinced that we are right..."

brainstorming sessions where they presented new ideas and developments, and suggested new deliverables while eliciting comments and suggestions from the audience. Such meetings were usually attended by various political, managerial, and technical decision makers.

Organizationally, the IDSC and the CBE made a major contribution in the formulation of the program document consisting of its objectives, scope, deliverables, phases, structure, etc. They also shared ideas in defining job descriptions for the various staff required for the program.

Program management effected a non-governmental working environment from the very beginning. Open flexible hours, a favorable working environment, a sharing and "soft" organizational structure, in addition to exposure to the latest I/DSS tools were the main theme and a major attraction for program personal. With this favorable working environment, good pay, excellent training and exposure, the program became a focus of attention for many graduates and members of the existing work force who wanted to change careers. It is worth mentioning that the increase in competition for time on the program has also increased the need for trained personnel to operate the program.

Recruitment, Training and Human Resources Development: With the facilities offered to the program by the HLEC, recruiting from outside the government and paying market based salaries and unlimited incentives, in addition to the positions offered, as explained above, DM&EM program management were able to be very selective in their choice of staff. They recruited a mix of IDSC employees (transferred), CBE - LEDD employees (transferred) and others of equal caliber from the market place. The program proved that although academic and professional backgrounds were important, proper selection of staff,

coupled with the relevant training and human resources development plans, would yield the desired caliber of staff. The program human resources development plan's aim was to produce economic information specialists, technical I/DSS specialists, and debt management specialists. The purpose was to form a solid nucleus of I/DSS debt management specialists that could support the strategic as well as the tactical goals of this ambitious program.

Incentives and Career Planning: Incentives and monetary rewards did yield good results in terms of staff performance and productivity. With direct objective criteria for incentives and rewards it proved to be cheaper and more cost effective than the government system. The reason behind this was that even though the government salary scale was lower it proved more costly since a larger number of people had to be hired to compensate for the low productivity rate. Government workers are paid incentives regardless of their productivity since it is used as a means of compensation for low pay. In the system where seniority is based upon age and time on the job, not achievement, job descriptions do not match the qualifications of the job holder, and in the absence of performance and accounting criteria, differentiation via promotion and incentives is next to impossible. In overcoming these problems, program management developed very concise incentive criteria that were based solely upon performance and creativity. Incentives and rewards were much more than monetary benefits; they included travel and in-kind gifts. Overall, it was a cost effective transaction for the DM&ME program in the sense that they were paying extremely high incentives, but to fewer individuals and only those meeting stringent criteria.

Furthermore, career planning was an integral part of program management's tasks and objectives. Our findings and the results of the

interviews, together with documentation on the program, indicate that a considerable amount of time was spent on career planning, job descriptions, organizational structures, performance and promotion criteria and other career aspects. Some of these aspects were touched upon in Chapter V, Section C and Figure V-2.

Prototyping and User Involvement: The design and delivery strategy followed by the DM&EM program was viewed as an iterative approach of I/DSS introduction to a new culture. The conditions and constraints faced during the early stages of the program dictated executing an easy and smooth penetration strategy. Following a prototyping approach, the aim was a fast and phased design and delivery mode of operation that encouraged and linked users and support incrementally. Our analysis of the research findings shows that at the beginning of the program seven out of ten ideas were generated by program management i.e. experts, consultants and staff. The balance represented those ideas initiated by users in the form of new requests and inquires. Moreover, we observed that six out of ten of the user generated ideas were general enough, and useful at the same time, to the extent that the program chose it to be one of its regular services[12]. Over time, various users of the program built their own capacities and capabilities[13] and were able to identify new target service areas and produce their own required support.

---

[12] An example of such output is the "External Debt Outlook" a classified report that is produced monthly showing changes in the external debt situation, its analysis, presentation of different scenarios and suggestions that could be implemented by decision makers to reach a better external debt situation. What we have observed is that 75% of the structure of such reports are based on numeric and graphical representation. Moreover, beside its printed format, it is being supplied electronically to interested decision-makers allowing them to maneuver more with their inputs and gaining a different look at their issue.

[13] Personalized I/DSS service in the form of I/DSS back office attached to the office of the decision maker and improvised in his process of decision making.

Moreover, while user involvement was dependent on several variables, the most important was user awareness in terms of (i) the magnitude of the problem and its real implication on the national economy and (ii) the capabilities of I/DSS tools that could contribute significantly to the solution. User awareness and involvement have enriched and contributed to the building the program.

c. Institutionalization

During this phase, the managerial perspective suggested that full transformation of the DM&EM program be appraised via realizing a series of objectives, assessing problems, facing challenges and seizing opportunities. Moreover, throughout the series of interviews conducted, we observed that seven out of ten requests were still being posed by decision makers. This result indicated a general agreement that expanding the implementation and institutionalization of the DMU to complement the DM&EM program was essential. We have noted that success, if realized, is very much dependent on the accumulated experience and the increasing user needs. We have also observed that most users have stressed the fact that they are keen on pushing the program to continue development of the complementary phases at the same operational mode but having learned from the lessons highlighted above. Finally, we believe that this accumulated experience could be made useful in other similar situations and its transportability would represent a power shift for those who would benefit from it. It is worth mentioning here that debt management needs to be looked at as a group effort involving many different countries rather than on individual basis since success and failure seem to affect the world economy. For this reason we support the Egyptian efforts in establishing the African Debt Management Center.

C. Quantitative Perspective Analysis

1. National Economic Perspective

The national economic perspective reflected the impact felt as a result of the DM&EM program and translated it into unprecedented amounts of debt forgiveness from major bilateral creditors, as well as the debt and debt service relief provided by the Paris Club. This in turn allowed Egypt a unique position for recreating some sort of creditworthiness among creditors and investors. The GOE constantly had in mind that the success of the DM&EM program would ensure that the Paris Club countries would indeed provide the 50 percent net present value (NPV) relief which was necessary for a meaningful attack on the debt hanging over Egypt.

Moreover, the GOE committed itself to seeking, from all its external creditors holding debt of comparable maturity (explicitly non-Paris Club countries, commercial banks and suppliers), debt reduction and re-organization arrangements at terms comparable to those set forth in the Paris Club Agreement. In actuality, arrangements with these creditors may not be more favorable (to creditors) than those provided by the Paris Club. The GOE committed to regularly informing the secretariat of the Paris Club (for the first time by January 1, 1992) its progress in this regard (Ebied, interview – 1993). Bringing the external debt situation under control was a necessary condition for restoration of some degree of creditworthiness and feelings of some tangible economic net gains. The following tables (VI-2, 3 & 4) give a numeric sense of the net gains realized as a result of the DM&EM program and compare debt service payments before and after the Paris Club 1991 agreement. These net gains will result if Egypt fully complies with current and projected IMF program terms and conditions aimed at energizing the Egyptian economy so that it can pay its debt and

external commitments in the future. Full compliance also means Egypt's achieving 50% NPV debt reduction over the course of its phased economic reform program.

Table VI - 2

(Millions US dollars)

Egypt's Debt service Payments Before and After the May 1991 Paris Club Agreement[14]

BEFORE 1991

	FY92	FY93	FY94	FY95	FY96
Original debt service Obligations	6420	1979	1943	1513	1762
	(6721)	(2308)	(2313)	(2123)	(1862)
ODA[15]	504	208	240	247	244
	(764)	(489)	(541)	(544)	(534)
Non-ODA[16]	5916	1771	1703	1515	1268
	(5956)	(1819)	(1772)	(1579)	(1327)

AFTER 1991

	FY92	FY93	FY94	FY95	FY96
Original debt service Obligations	672[17]	672	672	323	406
	(812)	(812)	(812)	(478)	(571)
ODA	27	27	27	60	60
	(147)	(147)	(152)	(195)	(205)
Non-ODA	645	645	645	263	346
	(665)	(665)	(665)	(283)	(366)

For comparison purposes, we have included case studies for Egypt if it does not succeed in firmly controlling its foreign debt and external commitment. The following two tables summarize what the results of the Paris Club debt reduction program would if Egypt does not fully

[14] Second Paris Club Negotiation Round - February 1991.

[15] Official Development Assistance Loans and sometimes called "concessional", meaning "debt not contracted on market terms".

[16] Debt contracted on market terms.

[17] The big difference in this figure in comparison to the the before 1991 situation is due to the debt forgiveness that Egypt has realized in this period.

comply with current and/or future IMF programs, i.e., if it achieves only 30 percent reduction (Table VI-3) or 15 percent NPV reduction (Table VI-4).

Table VI - 3

(Millions US dollars)
Egypt's Debt service Payments
30 percent NPV Reduction

	FY92	FY93	FY94	FY95	FY96
Post Paris Club debt service obligations	672	672	672	694	775
	(812)	(812)	(817)	(849)	(940)
ODA	27	27	27	87	87
	(147)	(147)	(152)	(222)	(232)
Non-ODA	645	645	645	607	688
	(665)	(665)	(665)	(627)	(708)

Table VI-4

(Millions US dollars)
Egypt's Debt service payments
15 Percent NPV Reduction

	FY92	FY93	FY94	FY95	FY96
Post Paris Club debt service obligations	672	672	672	968	1047
	(812)	(812)	(817)	(1123)	(1212)
ODA	27	27	27	103	103
	(147)	(147)	(152)	(238)	(248)
Non-ODA	645	645	645	865	944
	(665)	(665)	(665)	(865)	(964)

Note: Numbers between parentheses in tables VI-2 to VI-4 include debt service obligations to the United States, while those without parenthesis exclude them.

2. Egypt's Economic Indicators

According to Dr. Atef Sedki, economic relief was not the only purpose for implementing the program. The major goal was reversing the mind-set, which led to such heavy indebtedness, and paving the way for Egypt's economy to leapfrog into a new open market economy (Sedki, interview, 1993).

Other important net gains from the DM&EM program were the creation of vehicles for top policy and decision makers to act on the management of Egypt's debt portfolio. The program empowered these controllers with the checks and balances to safely lead the creation of an optimum debt portfolio for the country. It identified ways of avoiding the several pitfalls that were present before program implementation. Among these pitfalls discovered and recorded by the program team, as part of program output, were:

- The percentage of borrowed and not utilized loans peaked at 45% of country's total debt stock;
- an accumulated debt portfolio that tended to be very rigid and mostly inclined to public or publicly guaranteed debt to the extent that almost 80% of the total debt stock was owed to only three internal borrowers (namely the Ministries of Electricity, Telecommunications and Agriculture); and
- No standards and/or feasibility criteria had been adopted in the borrowing process making it possible for and even encouraging any institution (mainly government) to borrow, while failing to calculate how the debt would be paid back, the feasibility of the loan against its projected use, and the feasibility of the loan's terms and conditions (i.e., interest rate, grace period, borrowing currency, etc.), and finally failing to realize that the loan would be added to the country's debt stock automatically through the CBE.

In conclusion, it is our opinion that the need for a radical shift in the attitude of decision makers, was the ultimate goal to be achieved. This shift needed to move decision makers away from accepting given and/or imposed lending terms and conditions to a more discriminating mode in choosing what was most suitable to Egypt's economic abilities and needs (Sedki, interview – 1993).

Figures VI - 4, 5,6 and 7 gives a brief illustration of the change in the state of the Egyptian economy following the introduction of the DM&EM program (1982-1996)[18].

Year	82	85	86	87	88	89	90	91	92	93	94	95	96
TDS/XGS (%)	21.4	28.5	30.6	19.9	24.9	28.5	26.3	16.7	20.8	17.44	15.08	13.09	13.61

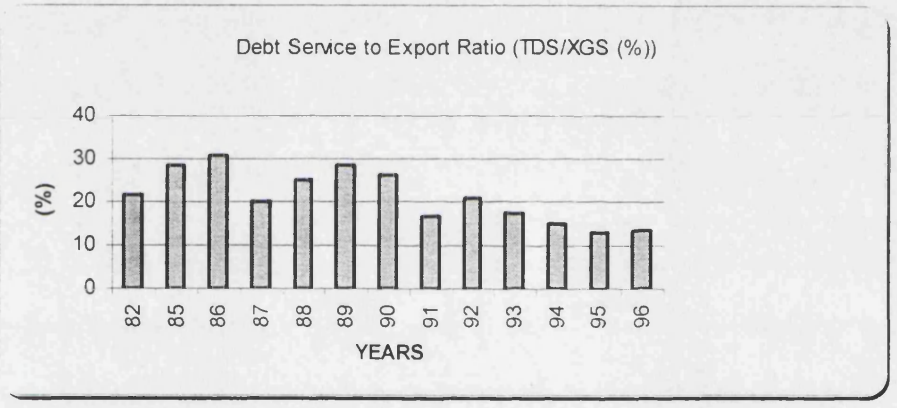


Figure VI-4
Changes in Egyptian Economy Following Introduction of DM&EM
Debt Service to Export Ratio

[18] The DM&EM Program Information Bulletin 1996

Year	82	85	86	87	88	89	90	91	92	93	94	95	96
Res./EDT (%)	6.1	3.8	3.8	4.9	4.3	4.8	9	15.2	24.56	32.58	35.04	38.38	44.21

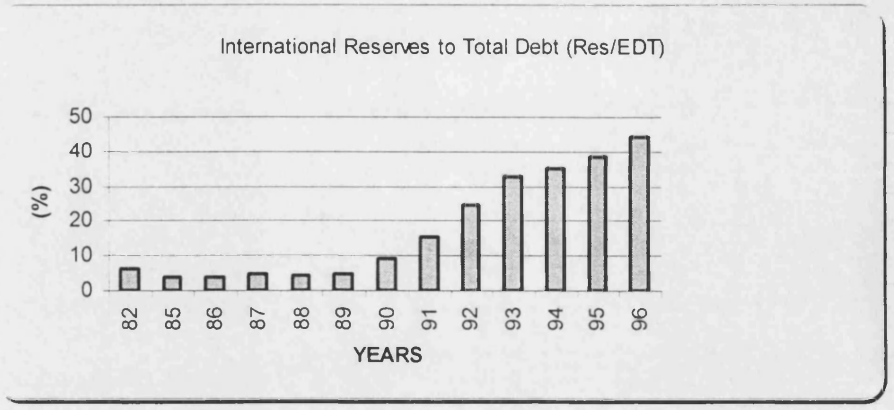


Figure VI-5

Changes in Egyptian Economy Following Introduction of DM&EM

International Reserves to Total Debt

Year	82	85	86	87	88	89	90	91	92	93	94	95	96
Res./MGS (Mon)	1.9	1.3	1.6	2.7	2.1	2	2.6	4.4	5.4	6.2	6.9	6.9	7.3

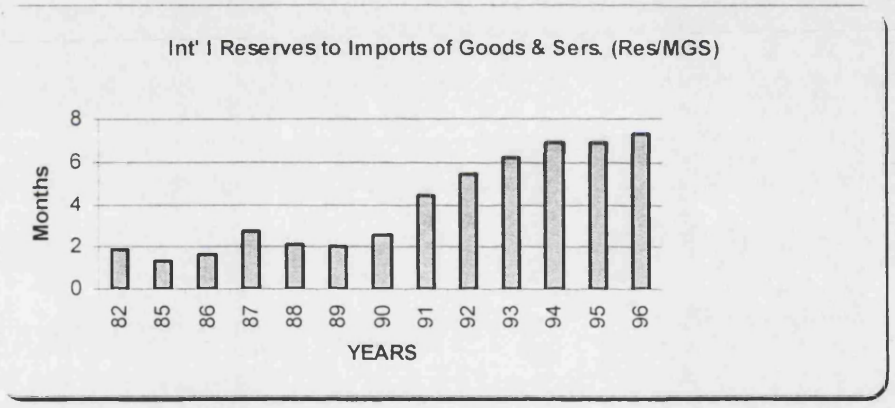


Figure VI-6

Changes in Egyptian Economy Following Introduction of DM&EM

International Reserves to Imports of Goods & Services

Year	82	85	86	87	88	89	90	91	92	93	94	95	96
EDT/XGS (%)	332.2	385.5	463.3	547.3	453.5	435.1	312.9	280	235.36	229.8	261.9	227.2	207.1

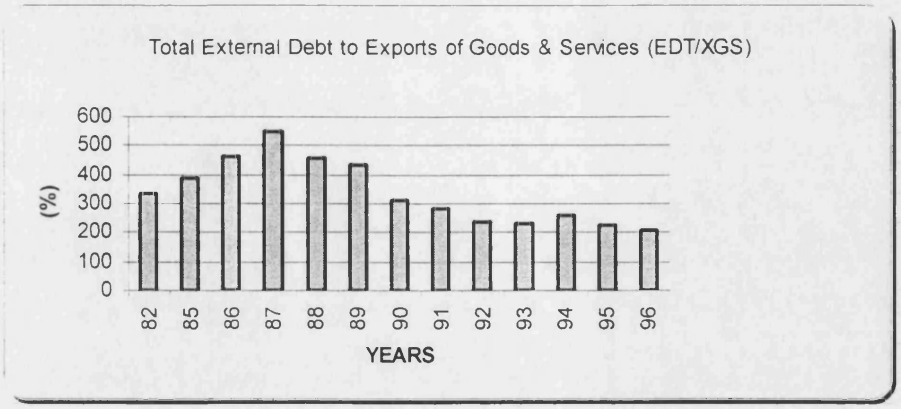


Figure VI-7
Changes in Egyptian Economy Following Introduction of DM&EM
Total External Debt to Export of Goods & Services

3. International Economic Perspective

Our international economic perspective looks at views and perceptions of several reputable financial institutions on the improvements in the Egyptian economy to date.

a. The Paris Club gateway

The 1991 Paris Club Agreement gave Egypt's creditors the choice between three different options (debt stock reduction, interest reduction and interest capitalization without interest accruing on the capitalized part) for debt originally contracted on concessional terms. It also gave them two different options (debt stock reduction and interest reduction) for debt originally contracted on market terms. In all cases, the new terms were constructed so that the NPV value of the original debt service payments would be reduced by at least 15% (option I) if the present stand-by arrangement with the IMF were canceled and/or no new arrangement existed 18 months after the expiration, and at most 50% (option III) if the IMF arrangements still

existed after three years. In between, a possibility of 30% (option II) NPV reduction was offered and would come into effect if the IMF approved arrangements for three years, but no agreement could be reached for the period following the end of the third year. Egypt faced a situation whereby, in all cases, creditors might cancel the arrangement if a number of conditions were not met, including if Egypt failed to fulfill the financial obligations stipulated in the agreement.

Furthermore, while the Paris Club provided an important framework for the treatment of debt service obligations, it was mandatory that Egypt engage in bilateral negotiation with all participating creditors in order to consolidate the detailed debt data, i.e., loan terms and conditions, in addition to agreeing on the appropriate market rate for calculating future payment terms.

In December 1991, successful agreement was reached with France, the United States and Canada. The year 1992 was set as the deadline for Egypt to reach agreements with all other creditors (or at least the major ones that constituted 80 - 90% of the its debt stock). Because of the complexities of the agreement, a special account for the first three years' debt service payments was established with the Banque de France into which Egypt deposited US$ 175 million quarterly starting October 15, 1991. On top of all this, creditors had the right to sell or exchange all outstanding claims originally contracted on concessional terms, and up to 10 percent (or US$ 20 million, whichever is higher) of claims originally contracted on commercial terms. Some creditors were reportedly considering ways to sell or convert claims through the debt conversion program when the debt conversion program started. Other countries, including the Netherlands, Switzerland, the UK and Finland, canceled part of their ODA claims (Kaddah, interview – 1993).

The following tables outline international recognition from Paris Club creditor countries for ODA and non-ODA debt. As indicated, there are

three conditional options for debt relief, each are bound by a set of phased achievements set forth by the IMF to be reached by the Egyptian economy. Egypt achieved the three phases reaching an agreement on total debt reduction of 50% as indicated in the last option (option III)[19]. The detailed options were[20]:

[19] Ghali - Al Ahram Newspaper interview, May 27, 1994 - Cairo - Egypt.

[20] Choice made by creditors

A. For concessional (ODA) debt:

All Creditors: July 1, 1991 - June 30, 1994

No principal payments, interest rate is 0.8%

"SUCCESSFUL"

	June 30,1994 Canceled **(OPTION I)**[21]	June 30, 1994 Successful **(OPTION II)**[22]	June 30, 1994 On track **(OPTION III)**[23]
Canada Finland, France, the Netherlands, And the UK	• Would cancel between 0 and 60.2% (depending on the appropriate market rate and the net present value of original debt service obligations discounted at that market rate) of principal. • Reschedule the remaining principal to be repaid between January 1997 and July 2002 • Charge from July 1, 1994, 5% fixed interest.	• Would cancel between 0.3% and 66.5% of principal (depending on the appropriate market rate and the net present value of original debt service obligation discounted at that market rate). • Reschedule the remaining principal to be repaid between January 1999 and July 2011. • Charge from July1, 1994, 5% fixed interest.	• Would cancel between 0.4% and 75.4% of principal (depending on the appropriate market rate and the net present value of original debt service obligations discounted at that market rate). • Reschedule the remaining principal to be repaid between January 2017 and July 2026. • Charge from Jul 1, 1994, 5% fixed interest.

[21] Option I: If the 18-month stand by arrangement was canceled and /or the IMF board had not agreed on a new arrangement by December 31, 1992.

[22] Option II: If the 18-month stand by arrangement was successfully concluded and the IMF board agreed to a new arrangement by December 31, 1992.

[23] Option III: If IMF program had been on track and the IMF board had approved arrangements for the period beyond June 30, 1994.

	June 30,1994 Canceled **(OPTION I)**[21]	June 30, 1994 Successful **(OPTION II)**[22]	June 30, 1994 On track **(OPTION III)**[23]
Belgium, Denmark, Germany, Italy, Spain And Switzerland	• Would reschedule principal to be repaid between January 2003 and July 2021. • Charge from July 1, 1994 an interest rate between 0.4% and 10% (depending on the appropriate market rate and the net present value of original debt)	• Reschedule principal to be repaid between January 2004 and July 2026. • Charge from July 1, 1994 an interest rate between 0.3% and 8.1% (depending on the appropriate market rate and the net present value of original debt)	• Reschedule principal to be repaid between January 2017 and July 2026. • Charge from July 1, 1994 an interest rate between 0.1% and 5.7%(depending on the appropriate market rate and the net present value of original debt)
USA	Would reschedule the principal remaining after the unilateral debt write off prior to the agreement so that it would be repaid between January 1994 and July 2021		

B. For Non-Concessional (non-ODA) Debt:

The Non-concessional debt was divided into batches:

First batch:
- All principal due as of July 1, 1991 according to the agreement of May 22, 1987.
- Principal and interest in arrears as of June 30, 1991,
- All principal and interest due from July 1, 1991 to June 30, 1994 on non-previously consolidated debt.

Second batch:
- All principal and interest due from July 1, 1994 to June 30, 1997.

Third batch:
- All principal and interest due from July 1, 1997.

All Creditors: July 1, 1991 - June 1994;

No principal payments. Interest payments on the first batch, according to the appropriate market rate, would be reduced by 30 percent.

For the first batch:

"SUCCESSFUL"

	June 30,1994 Canceled (**OPTION I**)	June 30, 1994 Successful (**OPTION II**)	June 30, 1994 On track (**OPTION III**)
Finland, France, the Netherlands, Germany, Sweden and The UK	• Would cancel between 6.2% and 12.6 of principal (depending on the appropriate market rate). • Reschedule the remaining part of the first batch to be repaid between January 1996 and July 2016. • Charge from July 1,1994 the appropriate market rate.	• Would cancel between x% and x% of principal (depending on the appropriate market rate). • Reschedule the remaining part of the first batch to be repaid between January 1996 and July 2016. • Charge from July 1,1994 the appropriate market rate.	• Would cancel between 53.2% and 61.7% of principal (depending on the appropriate market rate). • Reschedule the remaining part of the first batch to be repaid between January 1996 and July 2016. • Charge from July 1,1994 the appropriate market rate.
Australia, Austria, Belgium, Canada, Denmark, France, Italy, Japan, Norway, Spain, and Switzerland	• Would reschedule the entire batch to be repaid between January 1995 and July 2016. • Charge from July 1, 1994 an interest rate between 3.7% and 14.8% (depending on the appropriate market rate).	• Would reschedule the entire batch to be repaid between January 1995 and July 2016. • Charge from July 1, 1994 an interest rate between 1.9% and 10.2% (depending on the appropriate market rate).	• Would reschedule the entire batch to be repaid between January 1995 and July 2016. • Charge from July 1, an interest ratebetween 0.1% and 4.1% (depending on the appropriate market rate).
USA	• Would reschedule the principal as of July 1, 1991 (basically what remained after the unilateral debt write off prior to the agreement) as well as interest in arrears as of June 30, 1991 so that it would be repaid between January 2000 and July 2006.		

For the Second batch:

" SUCCESSFUL"

	June 30,1994 Canceled (**OPTION I**)	June 30, 1994 Successful (**OPTION II**)	June 30, 1994 On track (**OPTION III**)
Finland France, the Netherlands, Germany Sweden And UK	• Would cancel 15% of the batch. • Reschedule the remaining part of the batch to be repaid between July 1996 and January 2021. • Charge from July 1,1994 the appropriate market rate.	• Would cancel 30%of the batch. • Reschedule the remaining part of batch to be repaid between July 1996 and January 2021. • Charge from July 1,1994 the appropriate market rate.	• Would cancel 50% of the batch. • Reschedule the remaining part of the batch to be repaid between July 1996 and January 2021. • Charge from July 1,1994 the appropriate market rate.
Australia, Austria, Belgium, Canada, Denmark, France, Italy, Japan, Norway, Spain, and Switzerland	• Would reschedule the entire second batch to be repaid between July 1996 and January 2021. • Charge from July 1, 1994 an interest rate between 3.6% and 13.2% (depending on the appropriate market rate).	• Would reschedule the entire second batch to be repaid between July 1996 and January 2021. • Charge from July 1, 1994 an interest rate between 2.2% and 10.4% (depending on the appropriate market rate).	• Would reschedule the entire second batch to be repaid between July 1996 and January 2021. • Charge from July 1, 1994 an interest rate between 0.3% and 6.7% (depending on the appropriate market rate).
USA	• Would reschedule the principal as of July 1, 1991 (basically what remained after the unilateral debt write off prior to the agreement) as well as interest in arrears as of June 30, 1991 so that it would be repaid between January 2000 and July 2006.		

For the third batch:

"SUCCESSFUL"

	June 30,1994 Canceled **(OPTION I)**	June 30, 1994 Successful **(OPTION II)**	June 30, 1994 On track (OPTION III)
Finland France, the Netherlands, Germany Sweden And UK	• Would cancel 15% of the batch. • Reschedule the remaining part of the batch to be repaid between July 1999 and January 2024. • Charge from July 1,1994 the appropriate market rate.	• Would cancel 30%of the batch. • Reschedule the remaining part of the batch to be repaid between July 1999 and January 2024. • Charge from July 1,1994 the appropriate market rate.	• Would cancel 50% of the batch. • Reschedule the remaining part of the batch to be repaid between July 1999 and January 2024. • Charge from July 1,1994 the appropriate market rate.
Australia, Austria, Belgium, Canada, Denmark, France, Italy, Japan, Norway, Spain, and Switzerland	• Would reschedule the entire third batch to be repaid between July 1999 and January 2024. • Charge from July 1, 1994 an interest rate between 3.6% and 13.2% (depending on the appropriate market rate).	• Would reschedule the entire third batch to be repaid between July 1999 and January 2024. • Charge from July 1, 1994 an interest rate between 2.2% and 10.4 % (depending on the appropriate market rate).	• Would reschedule the entire third batch to be repaid between July 1999 and January 2024. • Charge from July 1, 1994 an interest rate between 0.3% and 6.7% (depending on the appropriate market rate).
USA	• Would reschedule the principal as of July 1, 1991 (basically what remained after the unilateral debt write off prior to the agreement) as well as interest in arrears as of June 30, 1991 so that it would be repaid between January 2000 and July 2006.		

b. Non Paris Club creditor countries

The seriousness of the Egyptian economic reform program in general and its debt management component specifically, qualified Egypt for an unprecedented amount of debt forgiveness from major bilateral creditors. It also provided Egypt with debt and debt service relief from the Paris Club, a fact that allowed Egypt to restore its creditworthiness among international creditors and investors. One of its highest priorities was the successful implementation of all necessary measures, the most important of which was the establishment of a solid debt management operation, in order to secure the Paris Club countries 50 percent net present value relief[24]. Non-Paris Club creditor countries also realized Egypt's effort in fulfilling its commitment to seek debt reduction and reorganization arrangements on terms comparable to those set forth in the Paris Club agreements.

One other form of international recognition and appreciation for the Egyptian debt management accumulated experience crystallized in a number of international invitations from different countries and monetary institutions for program personnel to present their experience and spearhead similar programs for countries facing the same problems. A good example was the invitation by the UNDP for Egypt to take the lead in establishing an African Debt Center for the continent's indebted countries (Hammed, Interview – 1993). These invitations represented a sort of deployment of Egypt's debt management to sketch out a full implementation plan for the establishment of such a center. It was mandated that this plan would provide all the technical and non-technical requirements, pre-requisites, foundations and outputs for countries using this center.

Moreover, the plan would also detail all resources required and provide

[24] President Hosni Mobarak - Speech in front of the Parliament - April 30, 1994

a clear guideline on how it would attack this chronic problem especially for countries that possessed characteristics similar to Egypt.

c. An IMF view

Howard Handy, the President of the IMF task force responsible for Egypt and the Middle East, headed a delegation to Egypt in February, 1997[25] where he announced that:

1. The economic growth rate would reach 5% in the year 1997. This growth would be considerably good for the economy and was expected to gradually increase to 7% by the end of the century.
2. IMF expectations were based on the re-engineering tasks under taken by the GOE together with the continuation of financial stability and the increasing rates of both saving and investment.
3. The "positive" surplus in balance of payment amounted to 1.2 billion US dollars for the year 1996. This represented a great achievement for the Egyptian economy and an affirmed indicator that the Egyptian government was applying economic measures which should encourage more foreign investors to come to Egypt and participate in its growth.
4. The deficit in the balance of trade was expected to reach 14% of GDP which would be no serious concern since it would be backed up by a huge surplus of other sources of foreign currency.
5. Egypt's performance in fiscal reform was outstanding to the degree that the deficit in the national budget was reduced to 0.08% compared to the anticipated figure of 11% as indicated by World Bank experts.
6. One of the major reasons behind that reduction was the decreased amount of debt service payment as a result of the Paris Club reduction for external debt. This reduction also reflected the gradual

[25] Press conference announcement during an IMF delegation regular review mission to Egypt, February 3, 1997, Cairo, Egypt.

restructuring of governmental expenditures towards the service, health and education sectors of the economy.

7. The fiscal restructuring allowed the reduction of the inflation rate to 6.2% in 1997. This was expected in the upcoming years to change the governmental deficit to surplus with the continuation of its fiscal measures.

IMF officials also appraised the privatization program in Egypt, with 22 major companies being privatized, resulting in returns that were equivalent to 1.5% of the GDP, most of which was directed to pay the internal debts of public sector companies to banks. The other portion was directed to compensate the labor force that might have been harmed by such privatization. Officials also added that service of internal debt is expected to decrease to 50% of the GDP, which would result in further reduction in the deficit of the BOP. They also appraised the growth in the Egyptian stock market and concluded that prices were not overly high especially since the price index was still at a reasonable level.

It is worth noting that the IMF, together with the World Bank, was a major economic reform reference for the GOE and the DMU in successfully implementing the debt management program. The DMU's guidance and approval for the general framework and the programs basic objectives was crucial to achieving success.[26]

d. A Standard & Poors view

Internationally, DM&EM program users, mainly Egyptian HLEC top policy and decision makers, have realized considerable international recognition and acknowledgment from top distinguished international financial and monetary institutions. Standard and Poors (S&P)[27] in its

[26] Economic reform and debt management are tightly coupled since most economic ratios can be adjusted through various debt management techniques.

[27] One of four (two American and two Europeans) internationally recognized and

latest report[28] had the following to say about Egypt's economic performance:

1. The credit and investment rating for Egypt reflects a strong Egyptian (political and economic) commitment to financial and economic reform in order to achieve a healthy economic environment.
2. Egypt has successfully managed to decrease its financial deficit to 1.3 % of its GNP during the fiscal year 1995/96 and is confident of reaching 1.1% during fiscal year 1997.
3. Nowadays Egypt has one of the lowest external debt service payments, including short-term debt, when compared to others having similar ratings. In other words, Egypt's debt service payment now falls at or below 17 % of its total yearly exports.
4. Egypt has been granted the following ratings: -
    a. B3 rating for long-term credit investment of hard currency;
    b. A3 rating for short-term credit investment of hard currency; and
    c. A2 rating for short-term credit investment of local currency.
5. The improvement in credit ratings reflects strong financial and economic strategies and policies that the GOE in general and the CBE in particular have successfully managed over the past years. S&P confirmed that this improved rating[29] reflected Egypt's success in decreasing the inflation rate to 7.1% in 1996 and stabilizing real interest rates on savings and exchange rates for foreign currencies.
6. Egypt successfully built a strong foreign currency reserve of approximately $19.0 billion (in Dec. 1996) that in itself resulted in a more secure position in terms of financial liquidity needed for satisfying at least one year of the required imports. The report considered this level of financial liquidity to be one of the highest

---

well-perceived financial rating institutions who perform country rating worldwide.

[28] Published on January 15, 1997, London, UK.

[29] Credit rating is highly affected by the status of external debt management especially the debt service ratio (Khattab, interview – 1993).

among countries given the same rating as Egypt.

7. Improvement in economic conditions and its reflection on per capita income resulting in an increase from $ 690.0 in 1990 to $ 1200.0 in 1995[30].

It is worth mentioning that this was the first time Egypt had been included in the S&P rating for world ranking credit and investment. This in itself represented major international recognition for what the Egyptian economic reform program in general and the debt management operation in particular had been trying to achieve.

According to an Egyptian Minister. " This rating is very important for Egypt since institutions like S&P do not rate a country unless they are confident about the country's economic stability. In other word's, it is even more important than the ratings performed by international institutions such as the IMF and the World Bank since the latter only develop ratings for countries requesting new money, re-scheduling debt and / or facing serious difficulties with current economic conditions and specifically with current debt stock (the case of Egypt prior to 1985). Rating and ranking by a well-known financial institution such as S&P addresses a different type of audience, mainly foreign investors, thus acting as a neutral foreign investment advisor for those who are seeking promising opportunities worldwide. This report placed Egypt with other economically promising countries such those in Eastern Europe. It gave Egypt a higher rank than Turkey, Argentina, Brazil, India and Mexico and on the same level with the Philippines, Indonesia and China".[31]

In our opinion, the S&P report offered Egypt and its promising and growing economy significant creditworthiness. In turn, it empowered Egypt's position in achieving more international credibility in front of

[30] IDSC, Economic Bulletin, August 1996.

[31] Ghali - Al Ahram Newspaper interview, February 19, 1997 - Cairo - Egypt.

international financial and monetary institutions. As a result, it decreased the cost of financing foreign trade and positioned Egypt on the international investment map for promising countries.

D. Conclusion

The success achieved by the GOE in its attempt to establish an economic reform program has been generally recognized at the organizational, national and international levels. This success was mainly due to success factors such as the Privatization Program, Capital Market Reform Program, Export Promotion Programs, etc. The impetus for most of the above was the desperate need to rehabilitate and revive the Egyptian economy which had warred to near death by the mid-80's. Exorbitant debt, Egypt's most serious problem, required top government officials' attention as well as commitment. Clear identification of involved institutions and the proper definition for their roles and responsibilities was a solid pre-requisite. Moreover, due to the unique nature of each individual debtor country, the debt management system needed to be tailored to reflect all details of the debt situation and be flexible in suggesting and proposing scenarios. Since there were no ready made systems to buy or a text book to follow, we believe that the involved institutions (IDSC – CBE) have contributed a great deal in building up a solid I/DSS debt management. Moreover, they have succeeded in injecting the I/DSS culture into both builder/implementors as well as users of the system. Scenarios were presented in different formats (i.e., tabulated, graphical, interactive, etc.) were most valuable to top policy decision makers. Finally, a high percentage of decision makers interviewed relate the success of the Egyptian Debt Management and Economic Monitoring Program to positively affect the general economic environment in addition to increasing Egypt's creditworthiness in front of creditor countries and institutions.

Chapter VII
An I/DSS Debt Management Executive Framework

A. Introduction

There is a great deal of emphasis put on the relationship between debt office computerization and the larger institutional setting and/or decision making process, especially at the strategic level. One encouraging sign is that debt management I/DSS has improved the external debt situation which is no longer listed among the critical problems facing debt managers. Despite several missing functions and flexibility, most of the systems in place seem to be meeting at least immediate needs (mainly focusing on the operational aspect of debt management). This success has, in turn, fostered an overdue awareness of the real requirements for institutional building and the need to address other equally important critical factors that affect the success of a debt management operation.

In this chapter, we will detail a successful debt management systems' progression from a normal computerization process for a debt management operation to a fully comprehensive / workable executive framework that includes all of the success criteria discussed below. In it, we will demonstrate that national experiences show that information systems, especially decision support types, can help countries organize their debt management, but they are neither a relief in themselves, nor do they operate in a vacuum. Additionally, we will stress the fact that any I/DSS debt management system: a solid foundation for an institutional setting which encompass mainly stable and trained staff, appropriate legal framework, high level decision making commitment, effective communication and cooperation between data suppliers, debt management office personal and users. Until recently, computer systems supported only the accounting, statistical, and monitoring

functions of debt management (known as operational debt management functions); little emphasis was placed on the I/DSS needs of other functions such as policy, regulatory, and resourcing functions (known as executive debt management functions). The I/DSS base for these systems is normally at least partly available within each country and partly available from commercial and non-commercial international sources.

Although solutions supplied by international organizations or commercial vendors are clearly not a cure-all for debt management problems, it can be a cost-effective way to deliver knowledge about debt management. However, considerable effort, time and resources are needed to tailor any foreign experience to the local context and to overcome famous problems such as:

- the absence of accurate user requirements.
- the lack of a coordinated plan for debt information management.
- duplication of efforts within an office or across offices in different institutions.
- little or no data interface between systems containing the same or complementary information.
- inadequate resources, both material and human.
- the lack of express political will to support such systems.

Based upon the theoretical foundation, covered in Chapter III, and our empirical research observations and findings on the Egyptian experience, which successfully managed to define and execute the necessary changes to adopt imported systems and experience into a local context as discussed Chapters IV, V, and VI of this thesis, this chapter aims to propose a solid and comprehensive debt management executive framework. This framework will define the necessary success factors i.e., main corner stones, for successfully

choosing, implementing and managing a successful debt management operation. It should be stressed that the context of I/DSS application here is on the executive level of debt management. The bases of our proposed executive framework are mainly the following settings:

- Debt Management I/DSS Info-Structure Institutional Setting;
- Debt Management I/DSS Infrastructure Institutional Setting;
- Debt Management Legal Institutional Setting; and
- Debt Management Administrative Institutional Setting.

For each of the above factor, we will explain what each one means, define roles and responsibilities of involved personal, clearly point out ownership for each factor and highlight the impact of each factor on the others and on the debt management executive framework.

B. Institutional Setting for Debt Management

Since debt management is in a country's own best interests, a sound debt management program is a sensible and flexible way to aid governments in taking informed decisions to minimize the cost of borrowing and refinancing, or reducing the country's debt burden. Statistics shows that a highly indebted middle-income country could pay for all staff and systems required for good debt management with what it pays out in debt service in less than one day. The potential savings from a good debt management system should be adequate incentive for governments to invest in their debt offices as potentially cost-effective operations. This argument, however, must be directed at the proper executive government level which can respond to the trade-off between increased budgetary support for the debt office and the balance of payments implications of continued poor debt

management handling[1].

Throughout the literature, the debt management institutional setting has been addressed focusing on data gathering, information dissemination and the role of computerization in automating the process. According to a World Bank discussion paper[2], information dissemination was one of the basic and initial goals set for computerized debt management systems. Successful functioning of a computerized debt office depends on far more than informed acquisition of hardware and software. Before the benefits of a good and smoothly functioning debt management system can be realized, the institutional setting for that system can be appropriate, both to supply the system with data and to make use of system's information output. At this point, success depends more and more on solving the data-gathering problems "upstream the organization" and the data-dissemination problems "downstream the organization" from the system than on machine capacity or program power (see Chapter V, Sec. D).

Theoretically, the potential benefits of automating a country's debt office and the obstacles to successful computerization can be graphically summarized by the illustration in Figure VII-1.

---

[1] Ibid, 1989.

[2] "Debt Management Systems", World Bank Discussion Paper, Debt and International Finance Division, World Bank, Washington DC, 1989. (Discussion papers from the second Debt Systems conference held in Paris, France, April 24 -26, 1989 and sponsored by the World Bank.

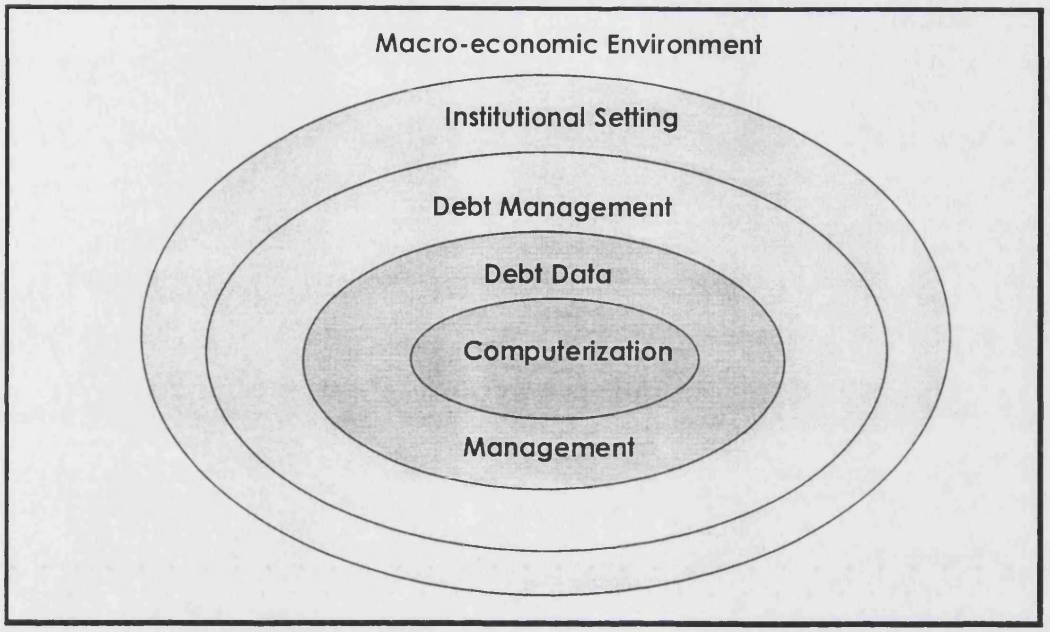


Figure VII – 1

Debt Management Institutional Setting

Figure VII-1 represents a group of nested functions that mainly represent a pre-requisite for one another. Such functions are:

Computerization, is mainly concerned with direct debt data management, the processes and procedures for collecting, storing, retrieving and analyzing data on a loan-by-loan basis.

Debt data management, in turn, supports the information requirements for effective debt management.

Debt management's ambition is to extend debt management functions to cover the executive level that deals with policy making, control and advisory functions, in addition to leveraging and shaping the decision making process concerning contracting new borrowing and preparing for debt re-organizations. It is also concerned with the operational functions that focus on the monitoring, statistical, and accounting functions. It is a prerequisite for every country that manages its debt to perform all of these functions, whether the

function are centralized in one agency or are distributed among a number of them.

Although we agree with the above-mentioned list of debt management functions, it does not represent a clear and operational prescription for an indebted country that is seriously aiming to solve its chronic problems. In the next section of this chapter we will propose a sample comprehensive executive framework that could fulfill the above functions and lead to a successful debt management operation. It will cover a broad perspective with an in-depth description on how to operate the executive framework and its various components.

C. Proposed Comprehensive Executive Framework

In the following section of this chapter, we will present and explain our proposed debt management executive framework. This framework is primarily based on our research findings which identified and defined key critical success components, on which a model executive framework institutional setting might be based. We believe that it could lead to a comprehensive and successful national debt management program. The proposed executive framework is shown in Figure VII-2

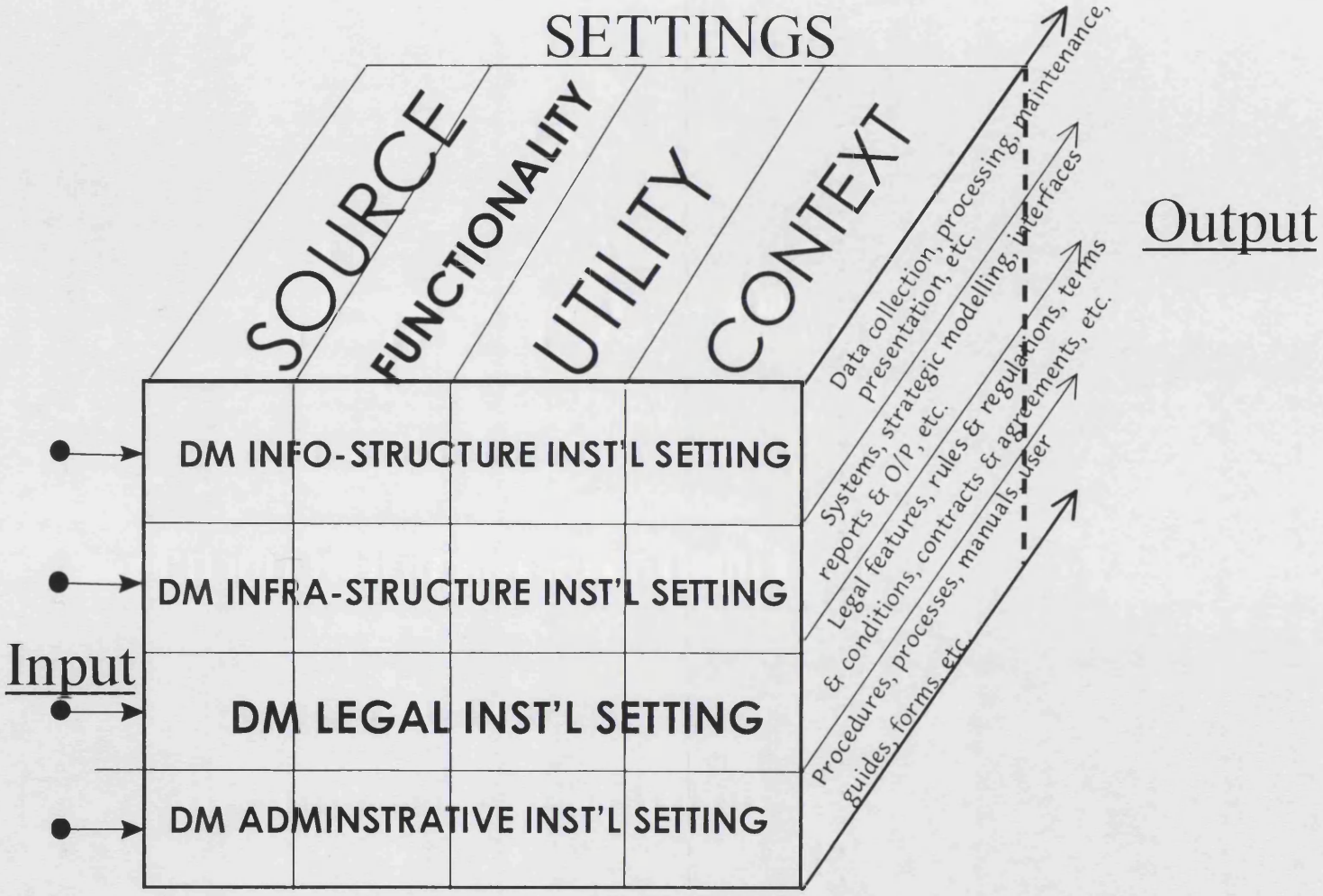


Figure VII-2
Debt Management Executive Framework

1. Debt Management I/DSS Info-structure Institutional Setting:

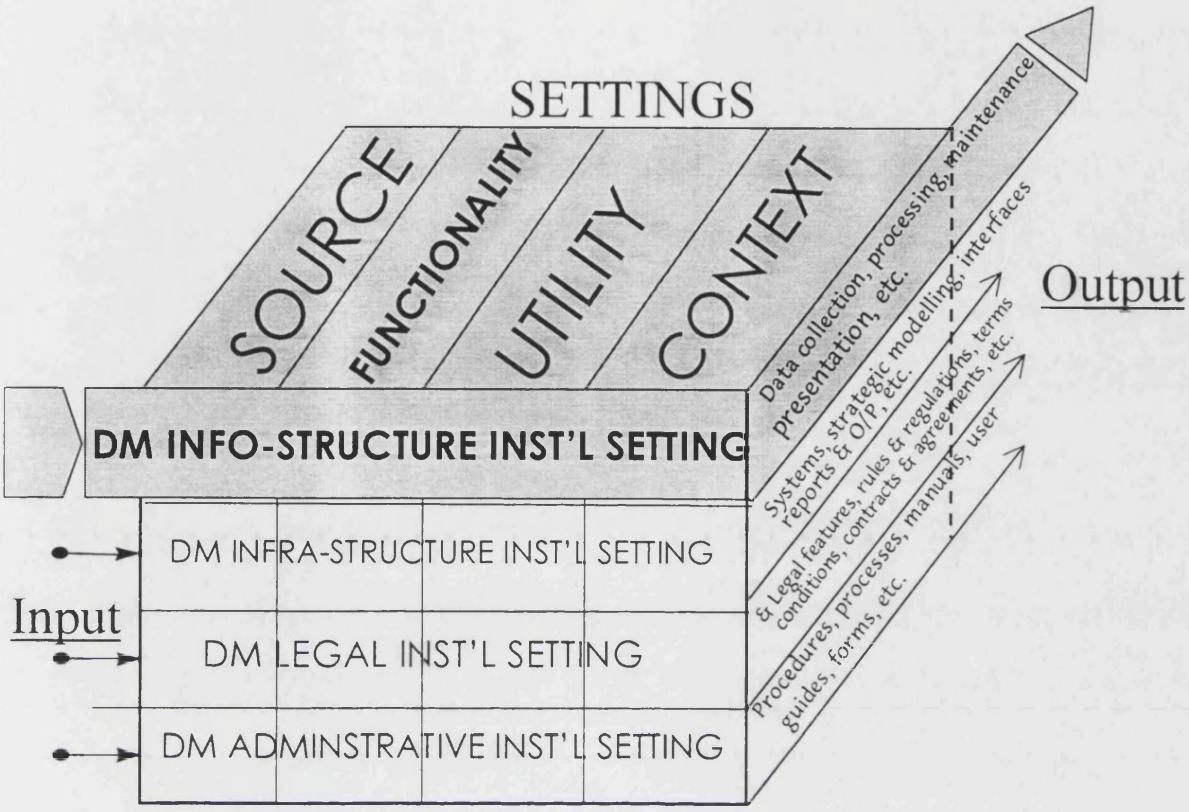


Figure VII-3
Debt Management Info-Structure Institutional Setting

The debt management I/DSS info-structure institutional setting (Figure VIII-3) deals with the soft side of the infrastructure needed in the process of leveraging and shaping top policy decision making. It closely looks at the development of a detailed plan for coordinated debt information management in a country and checks for duplication of effort.

This setting involves identifying all of the potential sources and users of debt information, as well as existing systems in place, and developing a rational approach to sharing the overall task of debt information management. This is often done as part of the initial assessment by the

core agency responsible for debt management and sometimes with the help of technical assistance agencies. However, potential overlaps, identified at this stage, may not be resolved prior to system implementation because of pressures from one or several institutions. Our research findings suggest that a detailed plan for coordination of debt information management should be developed and problems of mandate, overlap, information flows, and data standards be resolved, preferably before any system implementation work is done and, at any rate, before the system starts producing regular reports.

One problem, which may be identified as part of the process, is duplication of effort, especially in situations where resources are limited. In a number of cases, traditional opposition between the Central Bank and the Ministry of Finance resulted in some overlap and thus in wasted efforts such as duplicate databases, book keeping, human resources possession, etc). In the worst case, it runs the risk of ending up with conflicting sets of debt data (Kaddah, 1993).

In our opinion, operational guidelines for debt management institutional settings require the cooperation and coordination of the executive framework's info-structure institutional setting and the mechanism to coordinate the many aspects of debt management, including the use of computer based debt management systems. Guidelines should be developed as part of country's master debt information plan. We further recommend that special external auditors and technical assistance agencies review the effectiveness of this mechanism periodically as part of the process of monitoring debt management projects.

The debt management info-structure institutional setting needs to be the sole responsibility of the owner of the debt information data who is, in almost all cases the Central Bank. Being the owner of all debt data and the main source for publishing and releasing any official statistics,

reports and any credible figures, the CB takes sole responsibility for:

a. Developing a master plan and all the related execution procedures necessary for collecting, directing, cross checking and consolidating all related data;
b. Defining the necessary data collection and dissemination mechanisms to and from different sources;
c. Acquiring and developing all the necessary processing tools and techniques to be able to convert real data to meaningful information; and
d. Coordinating channels of data supplies and information requesters.

Empirical research has shown that the impact of a well-built debt management info-structure institutional setting leads to the proper foundation for a debt management scenario generation function. Most of our research sample set have stressed the importance of building a "clean" / "clear" database that carries the characteristics of being accurate, timely updated and comprehensive (covering all loans and grants and their details). As mentioned above, the building of such a component is very much dependent on having a solid debt management I/DSS infrastructure in existence and being maintained. Once such a foundation is created, examined and cross-checked, the process of defining, producing and executing different answers for top level decisions makers' questions becomes attainable. It needs to be stressed here that the function of constantly and continuously updating and cross-checking data is essential.

One other important function of the info-structure institutional setting, besides scenario generation, is acting as an early warning system for excessive debt or bad debt terms. It is simply a core for managing any indebtedness situation, not only managing debts, i.e., it creates an awareness and provides tools for "shopping - around" for the best

terms, best borrowing currency and best contracting conditions.

In summary, a well-built and maintained debt management I/DSS info-structure represents a high impact return component in any executive framework used for debt management since it is mainly concerned with content manipulation "soft part" that is the key to supporting the decision making process.

2. Debt Management I/DSS Infra-structure Institutional Setting

The debt management I/DSS infrastructure institutional setting (Figure VII-4) is mainly concerned with (i) the development of I/DSS for top policy makers and executives, and (ii) the build-up of an information infrastructure to help improve productivity in the country. As we saw in Chapter III and through the observations realized during the course of our study, the requirement of an automated debt management operation goes beyond simple and straightforward information systems. It necessitates a more advanced, complex and interactive live system (such as a DSS or EIS[3]) that can handle different types of problems (structured, semi-structured and / or ill-structured) and respond to different managerial / organizational levels (strategic, tactical, and operational levels). Such systems represent a challenge for developing countries. The characteristics of these countries, the problems faced, and opportunities existing together comprise some of these challenges.

[3] Executive Information System.

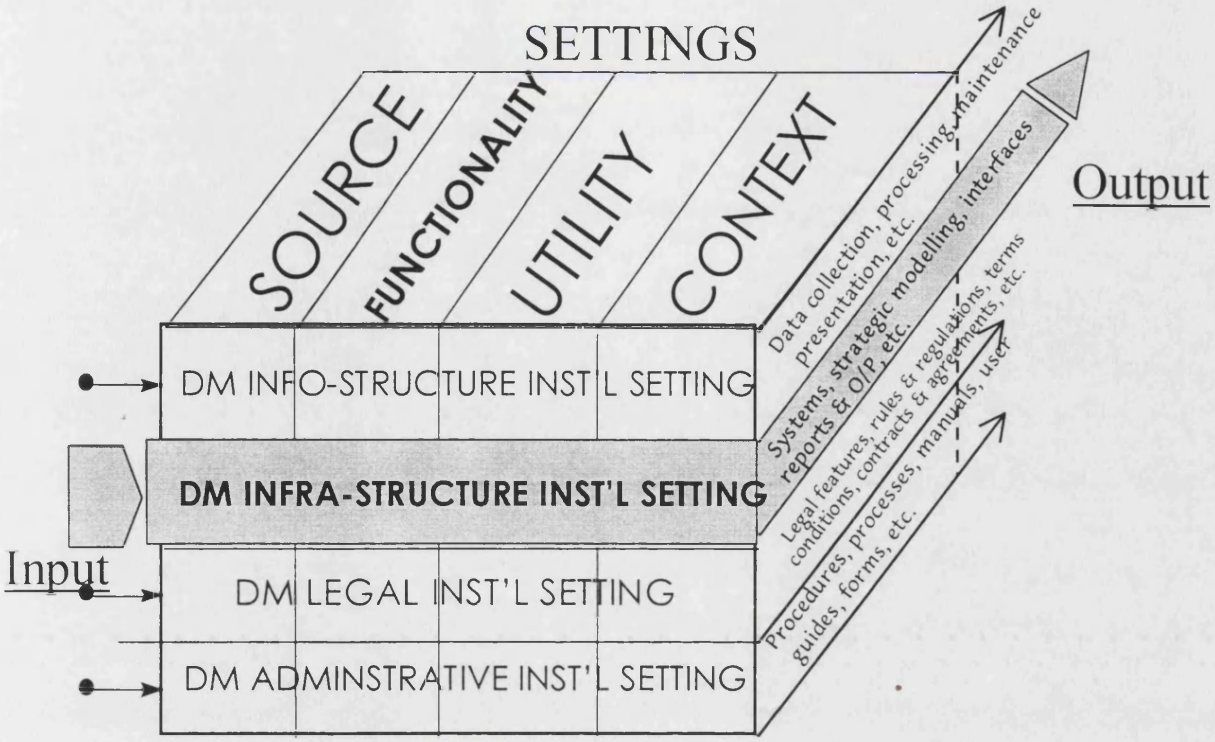


Figure VII-4
Debt Management Infra-Structure Institutional Setting

Among the increasingly recognized challenges that have to be carefully taken into consideration are:

a. Wide application gap:

There exist a wide gap between I/DSS practice and technological innovations. Additionally, there exist a very poor tracking capabilities for new / appropriate technologies specially in developing countries. The rate at which new technologies, techniques and innovations are diffused is still slower than desirable. Central to this is the gap between practitioners and technical experts, each group having its own jargon and with very little, if any, in common.

b. Lack of technical expertise:

Most developing countries suffer from the scarcity of technically

capable resources. Some countries like Egypt, Mexico and Turkey have qualified human infrastructure, which can potentially be developed, but which requires proper training and a stimulating work environment. Other "technical challenges" that have been defined by known I/DSS experts such as Elam, Henderson, Keen and Konsynki, Keen, El Sherif, and others and which have proven to be an integral part of the success of complex executive framework I/DSS are:

a. I/DSS tools needed to develop interfaces in different cultural contexts (e.g., language interfaces like Arabic in the case of Egypt).
b. I/DSS software tools and generators, their availability and relevance to application areas.
c. I/DSS knowledge and its rate of assimilation in developing countries.
d. Management of the development of a number of decision support systems (more than one system or project at the same time). Existing approaches focus only on the development of a single decision support system for single or group decision making processes.
e. Institutionalization of I/DSS within application contexts.
f. Institutional fitting of executive framework I/DSS to existing decision making processes so that they work smoothly together.

c. Lack of informatics infrastructure[4]:

Most developing countries suffer from the limited use and availability of information and information channels.

d. A proposed approach for managing complex I/DSS programs:

In our opinion, El Sherif & El Sawy have proposed a very appropriate and important approach for managing I/DSS programs that has been adapted by a number of similar I/DSS programs studied during the

[4] El Sherif,H. and El Sawy, O. " Issue Based Decision Support Systems, " MIS Quarterly, V. 12, No. 4, Dec. 1988, pp. 550 - 569

course of our empirical research[5]. Figure VII-5 illustrates the main components of this dual-phase approach. Phase I is concerned with the realization of information and decision support systems while Phase II focuses on the institutionalization process.

The aim of Phase I is to provide support for policy needs and/or decision requirements, these are, hopefully, carried out through the use or development and implementation of appropriate I/DSS. Phase I consists of four main stages:

1. Debt management policy needs identification;
2. Debt management decision areas and requirements definition;
3. Debt management programs and projects development; and
4. Debt management programs implementation.

Phase II consists of the following main components:

1. Debt management systems adaptation;
2. Debt management systems diffusion;
3. Debt management systems adoption;
4. Debt management systems monitoring and tracking;
5. Debt management systems value assessment; and
6. Debt management systems evaluation.

Together, they provide the basis for continued use of the I/DSS being developed.

[5] Other I/DSS program developed and implemented by the Cabinet IDSC.

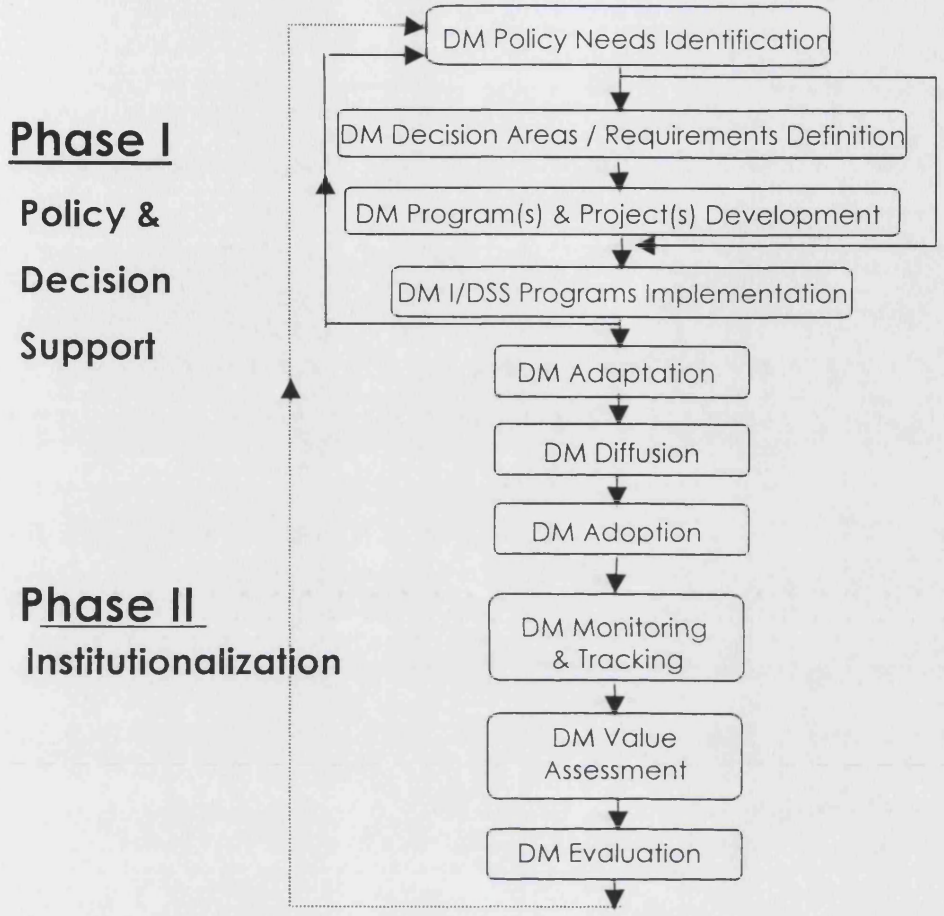


Figure VII – 5

A Proposed Approach for Managing I/DSS Programs

DM= Debt Management

Phase I: <u>Providing Debt Management Policy & Decision Support</u>

1. **Debt management policy needs identification** includes two main policy requirements:
   a. Planned debt management policy support that provides:
      1) Debt information and policy support for:
         a. Main debt policy issues discussed at strategic decision making levels such as the Cabinet level (or HLEC);
         b. Debt management plan monitoring;

c. Other debt issue-based I/DSS

2) Development of other related multi-sectoral macro / micro economic I/DSS (such as capital market I/DSS, credit system I/DSS, etc.)

b. Debt management crisis support at the policy making level.

2. Debt Management Decision Areas and Information Requirements

Definition deals with translation of the planned debt policy support areas into debt decision areas and information requirements. This process includes specification of major debt issues previously discussed by top level decision makers and defining debt I/DSS-related areas for reform over a five-year period. Both debt policy and I/DSS requirements impact the program(s) and project(s) development and implementation processes.

For each main debt policy and/or I/DSS area, a program needs to be formulated with specific goals and dedicated resources. A master network and related detailed project(s) networks need to be developed to reflect both the strategic requirements and specific tactical deliverables. Typically, policy makers will require fast response time, focus on results, and action-oriented projects. Therefore, projects have to be designed with these criteria in mind. We need to stress the point that, based upon empirical observation, successful projects need to be composed of two-tiered teams with interdisciplinary background, one team possessing the experience to deal with the bureaucracy, typical government officials, and policy makers, and the other possessing first rate knowledge about the technology. These two-tiered teams proved to be very useful in narrowing the application gap(s) between users and builders or implementors of I/DSS.

Finally, Phase I stresses the necessity of a well built I/DSS which is mainly

concerned with I/DSS tools and techniques, development platforms, localization, contextual fitting issues, etc.

Phase II: Institutionalization

A problem that has manifested itself throughout our theoretical as well as empirical research is that builders of I/DSS do not pay enough attention to the process of institutionalization. This process requires the design of a "change strategy" including the adaptation, diffusion, and adoption of the I/DSS (El Sherif and El Sawy, 1988). It should impact the implementation process and allow dynamic development evaluation of I/DSS capabilities within the application contexts. Thus, institutionalization is directly related to the extent that such information and decision support is useful in a given context.

Debt management institutionalization strategy needs to be based on existing knowledge and the diffusion of innovation, transfer of technology, and key concepts of adaptation of technology provided by I/DSS (e.g., adaptive design support for user involvement).

1. **Debt Management Adaptation**: The first component of the debt management institutionalization process focuses on the adaptation of debt management I/DSS capabilities to the contextual characteristics of a particular country (cultural Interface).
2. **Debt Management Diffusion**: The second component, debt management diffusion, refers to the need for spreading acceptable innovation within different settings but within the same context. Implicitly, such debt management I/DSS capabilities should have attributes that lend themselves to diffusion of innovation including relative advantage, compatibility, observability, and the ability to try different scenarios.
3. **Debt Management Adoption**: The third component of the debt management I/DSS institutionalization strategy focuses on the

adoption process including all the capabilities, requirements and needs of a given user (user interface). A user interface should integrate both the managerial and human characteristics. Such interfaces should be designed not only to reflect the ease of use and friendliness for the ultimate user, but to consider as well his functional activities and mental context, in addition to his own jargon.

4. **Debt Management Monitoring and Tracking:** The forth component of the debt management I/DSS institutionalization strategy deals with monitoring debt management parameters of the critical issues, assumptions, priorities and information/decision requirements in addition to changes in the technology and their impact on the decision making process.
5. **Debt Management Value Assessment:** The fifth component of the debt management I/DSS institutionalization strategy deals with how decision support systems have greatly improved strategic decision making in Egypt. This includes tangible and intangible benefits such as improvement of decision making at the Cabinet and governorate levels better use made of available resources, debt management and technological infrastructure development.
6. **Debt Management Evaluation:** The final component of the debt management I/DSS institutionalization strategy deals with appraisal, analysis and validation of the added benefits of decision support systems created for socio-economic development planning.

The debt management I/DSS institutional setting needs to be the sole responsibility of a central, neutral, very powerful, and well-placed organization. The reason for that is the fact that it need to be regarded as the sole responsible source of issuing, enforcing and executing debt

management related decisions (definitely after consulting and coordinating with related institutions). Such an organization needs to belonging to a central government body (such as the Cabinet HLEC in the case of Egypt). It should have ultimate power of enforcement and/or execution of development strategies, programs, and projects.

The executive framework proposed is a "think tank", a fully developed organization attached to the Cabinet or the top level policy committee shaping the economic related aspects of a developing country (Ezz, interview - 1993). The Egyptian DMU supported by the Cabinet IDSC, exemplifies such an executive framework with all its advantages and disadvantages (Chapter IV, Sec C).

In terms of ownership, however, when we think of roles and responsibilities attached to the debt management I/DSS institutional setting, we mean a central role played by an organization such as the DMU supported by the Cabinet IDSC and complemented by other involved agencies and ministries such as the Central Bank, Ministry of Finance, Ministry of Economy, etc. The burden of coordination, monitoring and following up for such roles and responsibilities clearly lies at the core of the I/DSS institutional setting, namely the DMU. However, naming of roles and defining of each entity's responsibilities should be addressed and specified at a higher level such as the Cabinet and/or HLEC in the case of Egypt.

Finally, concerning the impact of Phase I and II on each other, each phase is considered to be a pre-requisite for the success of the other. In other words, institutionalization necessitates a solid formation of debt management policy needs identification, debt management decision areas and requirements definition, and debt management I/DSS programs / projects development and implementation. Equally important, the three components of the institutionalization phase (adaptation, diffusion and adoption) are key success factors for

proper/successful formulation, implementation and operation of complex debt management I/DSS programs.

During the course of our empirical research, it became apparent that an approach such as that proposed would lead to a high probability of success for a complex debt management I/DSS national program. The reason behind that is the fact that if it is properly implemented, I/DSS institutional setting would be a solid infrastructure that the info-structure, scenarios and solid decision making process could operate on. The key success of our proposed approach is built on the optimum combination of its four components and how well do they complement each other.

3. Debt Management Legal Institutional Setting

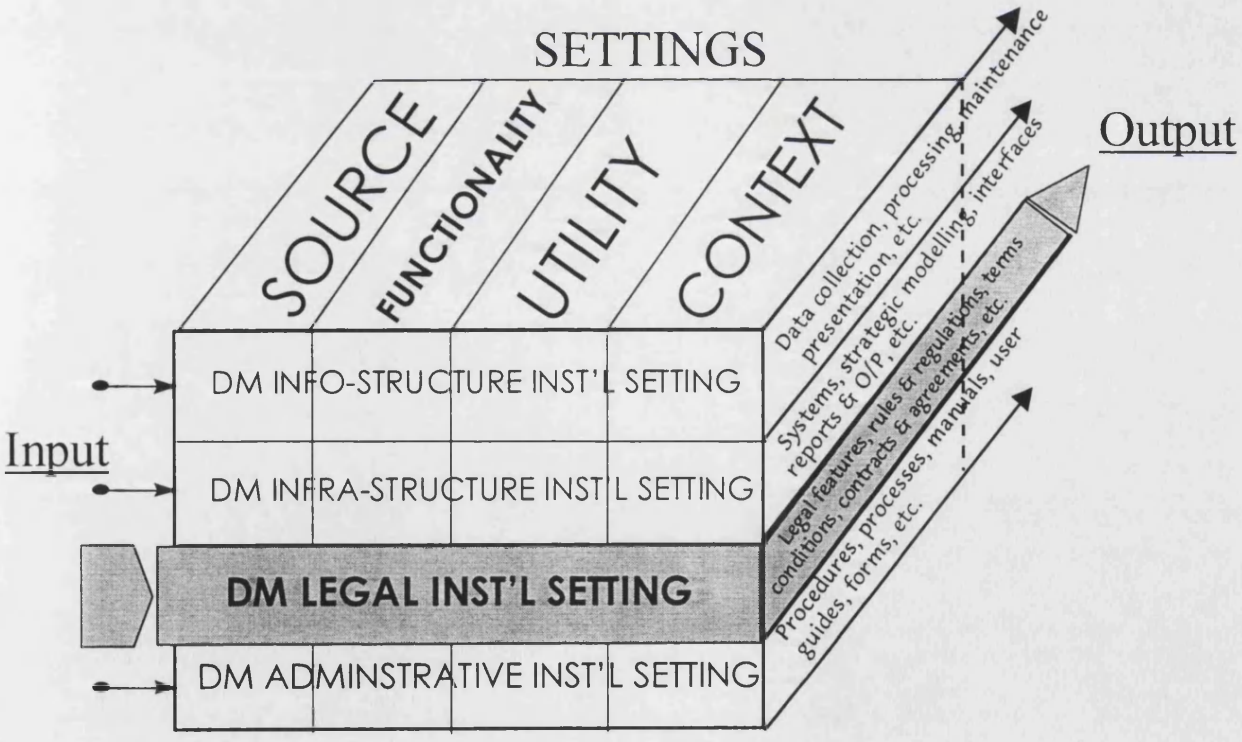


Figure VII-6
Debt Management Legal Institutional Setting

The debt management legal institutional setting (Figure VIII-6) is mainly concerned with the appropriate legislative and institutional framework for external borrowing. It requires separate legislation-set for borrowing by the government (for its use or for lending), private sector, and the central bank. This legislation-set has to be backed by regulations and procedures for the approval of each category of borrowing and service payments. Legislation covering the issue of government guarantees (generally by the Ministry of Finance), its criteria and procedures for their approval is also required. Additionally, procedures are necessary for making withdrawal applications for each loan (EZZ, Interview - 1993).

There are several agencies of the government that share responsibility for part or whole of the external borrowing process. These would probably be the Ministry of Finance and the central bank, possibly the Ministry of Planning (if the planning function has not been integrated with the Ministry of Finance), and the Treasury of the Accountant-General's office. In some instances, an autonomous body, the Ministry of International Cooperation in case of Egypt, is set up with special responsibility for external debt either by legislation or administrative order. Additionally, agencies responsible for distributing borrowed funds to projects and programs would have to be established (EZZ, 1993).

The legal framework for government borrowing needs to be generally set out in a Foreign Loans Act for foreign borrowing and a Domestic Loans Act for domestic borrowing. Subject to the satisfaction of certain conditions, these acts authorize the concerned minister or committee to raise loans on behalf of the government for specific purposes. It would require a responsible person or body to seek the views of the central bank on the terms and conditions of the loans, obtain the approval of the Cabinet and/or Parliament or equivalent body for the borrowing and table the agreement in Parliament after signature. It

may also be necessary to ensure that the borrowing will not result in the total outstanding debt exceeding the amount specified in an act or in a decision of the Cabinet or relevant policy committee (kaddah, interview - 1993).

The legal framework described in the preceding paragraphs exists in some developing countries such as Mexico, Turkey, and Egypt though all the provisions may not be complied with. It emphasizes the predominance of the Ministry of Finance and the central bank in monitoring the contracting loans, giving them a major role in loan operations and consequently in debt management. In most countries the Treasury, the Office of the Accountant-General or an equivalent office (Central Bank in case of Egypt) has the responsibility for initiating action on government expenditures, including debt service payments and the accounting thereof as well as loan receipts. In some instances, they have to be responsible for reporting on government guaranteed debt to Parliament or its equivalent. It is worth mentioning that, if the planning function has not been integrated within the Ministry of Finance or an equivalent body, it is recommended that the Ministry of Planning evaluate programs and projects while approving their inclusion in the capital budget of the country.

A country's legislation covering its borrowing, issue of guarantees, and the regulations giving effect to these legislations provide the basis for establishing institutional and administrative arrangements between the various agencies of government responsible for loan operations for regulating and monitoring their contracting, utilization and repayment.

We recommend that such debt management legal institutional setting ownership resides in the central bank which needs to be empowered to play the active role described above. In some instances, a top policy committee HLEC in case of Egypt) which represents the top authority responsible for a country's debt management specifically

and in most cases economic reform, monitoring and strategization in general guides the central bank. Representation in such a committee needs to be at the cabinet level (or at least deputy minister) and chaired by a prime minister (or deputy prime minister) and should include all top level decision makers involved in the debt management process (directly or indirectly). Definitely, the Central Bank should be part of this advisory committee, however it has a dual role as a main player in shaping its strategies and in executing major parts of it.

The impact of the legal institutional setting component of our suggested debt management executive framework is very powerful in overcoming the problem of lawyers playing only a marginal role in financial development and debt management. This is a typical problem in most developing countries, where appraisal and implementation of projects and programs have been firmly in the hands of financial analysts, economists and political actors. Developing countries have rarely taken legal expertise seriously, allowing contractors and other non-lawyers to prepare and negotiate legal documents such as loan agreements. To gain strength, the legal component of debt management needs to be mandatorily backed up by political commitment. We recommend that countries aim at a modern vision of the lawyer as an advisor rather than as an advocate called upon to resolve problems or controversies only after they have occurred. The lawyer as an advisor must, in fact, be prepared and capable to assist in all phases of a transaction, namely strategic planning, choice of sources of financing, negotiating, implementation, management, etc. Also, lawyers would help in formulating positions in clear terms, weighing alternatives and assessing the implications, rights and obligations flowing from a particular provision, and, of course, dealing with legal clauses such as those relating to constitutionality, legality and authority. In summary, the times when lawyers should be

involved are:

- when the decision to borrow is taken;
- during negotiations;
- during contracting; and
- during administration of the loan.

4. Debt Management Administrative Institutional Setting

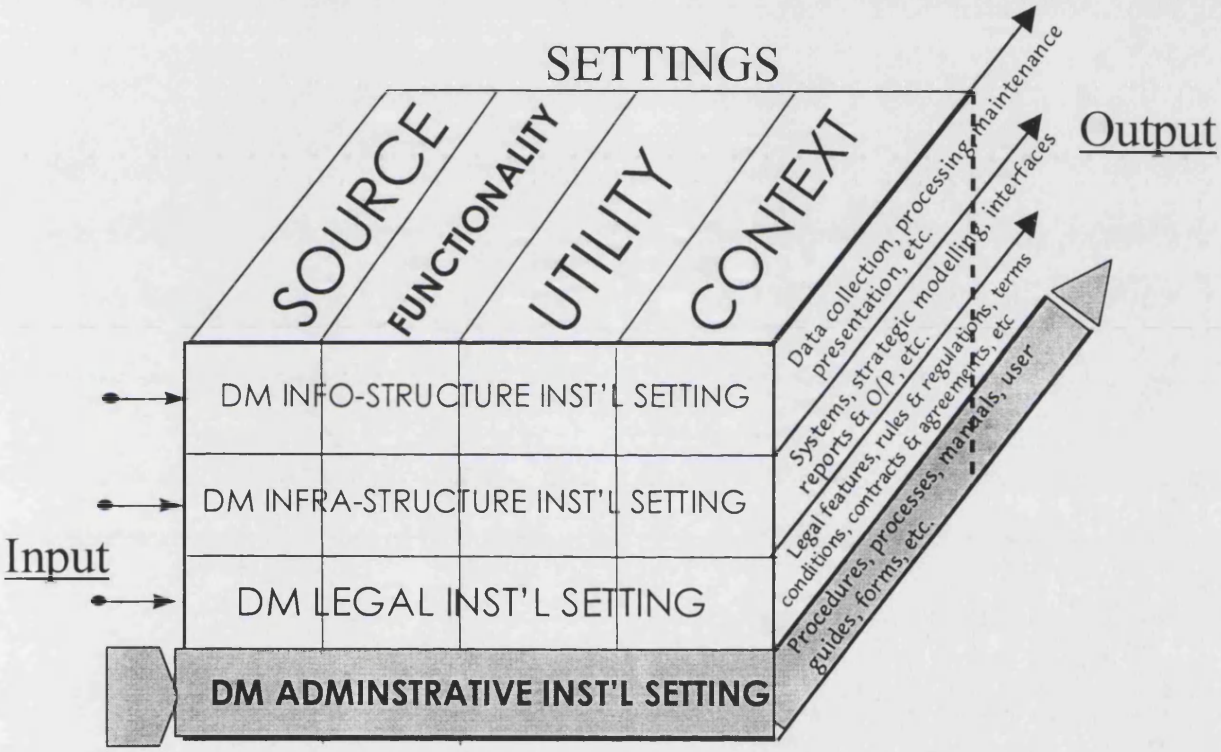


Figure VII-7

Debt Management Administrative Institutional Setting

The debt management administrative institutional setting (Figure VII-7) is mainly concerned with studying debt feasibility, loan management, and debt portfolio management. In addition, it coordinates between the different parties involved in debt acquisition and / or debt management and in negotiating and / or dealing with funding agencies and international monetary organizations.

This setting should have a common understanding of the government's debt strategy, the tools to be used in implementing the strategy and the different role(s) to be played in executing it. In most instances, the debt management administrative institutional setting will involve more than one agency playing a specific and hopefully a complementary role. For the day-to-day operations of debt management, it is essential that all parties involved in this process communicate freely and cooperate willingly with each other. Naturally, the more decentralized and complex the debt management system is, the greater the need for a framework of information, coordination and control. Simplicity and centralization, therefore, have considerable advantages especially during the early phases of a debt management program (Kaddah, interview - 1993). Unfortunately, this is easier said than done, in large debtor and/ or complex indebted countries, particularly when there is no binding framework for external borrowing and /or there are a large number of ministries and agencies involved in debt issues. Therefore, it is essential that, on one hand, the debt management administrative system be firmly established at the outset with clear and well-publicized rules and regulations. On the other hand, it should permit flexibility over time. Although, ideally, countries should have studied other systems, sought expert advice and thought hard about what they want before launching a debt management system, the start-up stage will nevertheless reveal the need for certain informal arrangements that should be reflected in the formal system (Hammed, interview - 1993). Thus, it will force possible modifications of the initial concept (as was the case when the IDSC and the Central Bank of Egypt agreed to start the Egyptian debt management program). More importantly, allowance must be made for some element of trial and error.

As we have seen in Chapter III and through the observations during our

empirical research, there are many different types of organizational executive frameworks. Each and every executive framework follows a different pattern of management and / or a decision making process. The success of any of these executive frameworks is mainly dependent on the optimum choice of some key success factors such as the organization's nature and type (rational, political, bureaucratic, and garbage can), type of work being performed, degree of automation, style of management adopted, etc. Though these success criteria are easily identified, we have observed that the relationship between organizational levels is not aligned with the management behavior and decision making pattern corresponding to the respective level. In other words, we observed that decision makers occupying a specific organizational level, for example the strategic level, are not only performing duties and responsibilities required and specified for that level, i.e., making strategic decisions, but are also forced to act on issues and decisions demanded by other organizational levels. The reasons for this phenomena that were discovered during the course of our research and that controlled and shaped our observations have been thoroughly covered in Chapter IV, Section B.

Organizational arrangement is one major component of the debt management administrative institutional setting where the implementation of a debt management project requires the early identification of an agency substantially involved in loan operations where the DMU will be located. The familiar choices would be from amongst the Ministry of Finance, the Planning Commission or Ministry of Planning, the Treasury or Accountant-General's Office, or the Central Bank. There might be instances where the DMU is set up as an authorized body mandated in legislation or an administrative order as it is the case of Egypt where the Ministry of International Cooperation is the entity administrating the DMU in the CBE that hosts it. Whatever

legal form this unit may take, it will be necessary to draw up detailed terms of reference and have them endorsed by the political authority in the country (Hammed, interview - 1993). Thereafter, it should be widely circulated within government, private sectors, and all creditor agencies that all requests for information on external borrowing comply with the terms of the mandate assigned to the DMU by the government.

It is recommended that a Debt Policy Committee (a sub-committee from HLEC in the case of Egypt) be set up to formulate an annual borrowing plan and strategy. It should establish procedures to ensure that the borrowing limits do not exceed the ceiling established on total outstanding debt, annual borrowing levels, the debt service ratio (DSR) and other debt indicators to be monitored. Further, a working group consisting of representatives from each of the agencies mentioned in the preceding paragraph should be set up to oversee the implementation of the programs with all its minor / major detailed steps. Some times, it may be useful to share this arrangement with a few of the larger borrowers.

The staff of the DMU should have experience in loan operations and accounts; and the capability to undertake debt analysis, evaluate loan portfolios, and identify opportunities for improving the debt profile in addition to computing skills with experience in the use of computers, database management systems and spreadsheet packages. Knowledge and familiarity with loan operations is necessary to interpret loan agreements and extract basic loan details. Knowledge of loan accounts would also facilitate the compilation of loan transactions. Computing skills would assist in mastering the use of the computer software and the basic tasks of database maintenance. Finally, economic and financial knowledge is necessary to undertake debt policy analysis and engage in active debt management. The actual

composition of a program team would vary in each country, depending on the complexity of the country's loan portfolio and loan numbers, availability of the required skills, the debt service situation, the priority assigned to debt management by the government and whether or not it wishes to computerize its debt data.

It is recommended that a solid training strategy be adopted since it is essential and crucial for the debt management administrative institutional setting. Training should be considered as a major component in debt management programs, carried out at various stages of the project cycle. The first step is to train staff to complete computer coded data entry sheets with information on basic loan details, the repayment terms, and disbursement and payment data. Interpreting loan agreements and extracting transaction data from loan files, ledgers and creditor statements assists in this. Further, it would involve the staff of the DMU and other agencies who will be submitting information directly to the DMU on data entry sheets. The next stage of the training would be for the staff who would be using the software. It would cover operating the computer; inputting data into the software; use of routines and modules in order to generate reports and scenarios; and various aspects of database maintenance. Once the database has been completed and the staff of the DMU is using the software to produce standard reports, the next phase of the training would take place. This phase would be on database management systems used for the development of software and formatting country-specific external debt reports using the report writing facility. Thereafter the training would cover the use of the management tools in the software and the query facility in the database management system to analyze the external debt of the country and evaluate the country's loan portfolio. Following this, the staff of the DMU would be trained in the use of the software for debt restructuring, including refinancing,

rescheduling and debt reduction. Finally, it would be necessary to familiarize staff with the preparations for debt re-negotiations with the Paris and London Clubs and with their procedures. Depending on the country's loan portfolio, additional training might be required to expose staff to the major financial markets and the loan instruments used to access them.

One solid conclusion that was drawn, based upon our empirical research, is that there is no textbook executive framework for the debt management administrative institutional setting for effective debt management systems. However, we were able to propose a nearly comprehensive executive framework, as discussed throughout this chapter, that encompasses almost all the components needed for debt management setups employed by different countries. They are normally highly complex mechanisms involving many functions, all of which are interrelated and interdependent. Quoting Mr. Tekka Sankala, a UNCTAD expert, who was the chief technical assistance expert involved in implementing the foreign component (DMFAS) of the Egyptian debt management program:

> " ... *Debt management systems and, in particular, the structures (or units which perform functions related to debt management) differ from country to country. They are shaped by historical precedent, constitutional division of responsibility between various tiers of the government, the internal organization of the government itself, the importance of external debt in overall economic management, the relative importance of particular types of credits within the overall debt structure, and the regulatory function of external debt management...*".
>
> " ... *Debt management systems differ in the degree of control exercised by authorities, the strictness of the*

regulatory environment and the nature of the reporting system instituted for external debt operations, which may be mandatory or voluntary, and which may require prior authorization for incurring external obligations or only exposit reporting. They also differ in their treatment of private sector versus non-financial domestic instruments...."

Debt management administrative institutional setting ownership lies with the Central Bank and the ministry / committee responsible for studying borrowing feasibility. In some countries, a ministry (Ministry of International Cooperation together with the CBE in the case of Egypt) is the entity responsible for studying new debt terms, conditions, feasibility and pay back ability of the borrower requesting such debt. This ministry is represented in a higher level committee (HLEC in the case of Egypt) where it presents / reports regularly on borrowers' requests, available lenders, new lending terms, and progress recommendations for approving or dis-approving of such request(s). It needs to be made clear here that it is the high level committee's decision that is taken into consideration whether or not it agrees or dis-agrees with the ministry's recommendations. The high level committee in most cases is the body aided by the DMU in all related aspects of new debt, debt rescheduling, debt payment abilities, etc. In our opinion, it is the decision maker, or in other words, the client, whom the DMU serves since the DMU encompass almost all parties involved in the debt process.

In our opinion also, the administrative institutional setting represents a vital component for the detailed dynamics of a successful debt management executive framework. It has been a key factor in the area of managing new borrowings, and dealing with the management of existing debt portfolios. Of the

four key components needed for a successful debt management executive framework, the debt management administrative institutional setting represents the main interface with the user / client for such a system, i.e., the system's beneficiaries seeks decision leveraging scenarios mainly through the debt management administrative institutional setting.

D. Conclusion

The four proposed critical success components discussed in this chapter represent the basic cornerstones for successful implementation of a debt management national program. They need to be fully developed and well maintained since they share equal importance and have almost the same impact on each other as on the success of the debt management executive framework.

For each of the proposed critical success components, there should be a defined owner or a group of owners who are mandated to build these components. Furthermore, the roles, responsibilities, and interfaces of the main players need to be very clear especially if more than one owner is involved. The same applies to the critical success components constituting the framework. Moreover, areas of overlap and duplication need to be identified for all actors in order to avoid any lost effort, time and money.

Finally, since the success of each component alone would positively contribute to the success of the executive framework as a whole, it is very much recommended that the optimum combination for the proposed four components be overseen by a single entity, preferably the one executing the debt management program. Besides having the four proposed critical success component well-balanced and managed, the key to success to any debt management program is the user, i.e., the client, who can make or break the success of any program. It is his degree of attraction and dependency on the system

that is a positive (or negative) indicator for the implementing and management teams.

Last, but not least, we believe that our proposed executive framework represents a well-tested path that an indebted country might follow in achieving its goals with the least amount of risk possible. This framework ensures a linkage and encompasses most components of almost all debt management systems reviewed in the literature. It links the entire source, utility and functionality of a powerful debt management executive framework.

Chapter VIII
Research Findings, Generalizations and Future Research

A. Introduction

This chapter provides a comprehensive review of our empirical research results. The research was centred on one major theme: the impact of I/DSS on debt management in Egypt. We will be analyzing the research findings across the different management levels: users and decision-makers, builders, implementers and program managers. Research findings, together with the information gathered from interviews carried out and the survey questionnaires completed by our targeted focus group will be considered. These findings are meant to explain the various development phases of the DM&EM program as discussed in Chapter V.

The program was studied in light of the theoretical foundation of the research presented in Chapter III. The nation-wide crisis in Egypt that led to program realizaton and the numerous problems associated with this process are detailed in Chapter IV of this thesis.

This chapter also covers our observation on the challenges faced by the DM&EM program during its introduction and the perception of the decision constituency in terms of acceptance, support, usage, and perceived impact on the process of decision making in particular and on the Egyptian economy in general. Moreover, it will shed some light on how the Cabinet IDSC managed to implement the DM&EM program successfully despite the overwhelming challenges attributed to resistance to change by government bureaucrats.

The research conducted for the DM&EM program revealed a number of illuminating conclusions that can be drawn from Egypt's experiences in introducing, managing and sustaining an I/DSS function for supporting the decision making process for such a nationally sensitive and crucial issue as external debt management. Moreover, it pinpoints

key lessons learned from the Egyptian experience in particular and on development and implementation of a DM&EM program in general. Finally, based on the lessons learned, we will conclude this chapter with a set of generalizations for future implementation of I/DSS programs in similar contexts, i.e. to support top government policy and decision making in developing countries. These generalizations are primarily based on our research findings; in addition, we will include correlation between our empirical research and other related research work done in the field.

B. Research Findings

Based on the analysis of the empirical research and the field work conducted on the DM&EM program, the following section will highlight the research findings in light of our thesis theme: the impact of using I/DSS for debt management in Egypt. Our findings correlate with a number of I/DSS research aspects such as project management, decision making, organizational dynamics, and potential challenges known to afflict government-related bureaucracies in developing countries.

1. Problems associated with the implementation and use of I/DSS Debt Management Systems:

The introduction of any technology - based tool can be impeded by a number of potential problems. Below we will be presenting some of the main observed principal problems encountered during the implementation process of the Egyptian debt management program and it was handled: -

a. Need for identification of the principal systems, user requirements and the logical selection of an approach and / or specific hardware and software:

A classic information systems problem (application development and / or use) that local systems staff are often unfamiliar with a set of applications (in this case the debt management application). Users, on the other hand, are unable to express their requirements clearly in systems terms, or because of their unfamiliarity with the capabilities of systems, are unsure of what they can reasonably ask for.

The DM&EM team were alerted to some of the above problems and managed to avoid part of it through exchanging information and experiences via hosting specialized experts in the field (to train staff on different levels) and extensive participation of DM&EM program management in conferences and workshops (such as those organised by the World Bank, IMF and UNDP). Such exchange of knowledge and expertise mechanisms has contributed much to enriching the program team's experience. Listening to other experiences, expressing their views and being warned about major pitfalls encountered have shortened their learning curve (Ezz, interview - 1993). Performance reports for the DM&EM team reflects such fast track learning.

One clear research conclusion was that selecting a system or a technical partner can require specialised knowledge and skills beyond those available in some developing countries and may necessitate the use of impartial outside advice. Egypt has learned from its previous failure case. According to Dr. Ebeid, choice was heavily influenced by considerations that had little to do with the relative advantage of the system software itself. It has depended mainly on the uniqueness of the case and the similarities between Egypt and other countries where chosen external technical assistance organizations had previous experience. Other considerations such as system's support (local / external), complexity, flexibility, scalability, nature of debt stock, and user requirements (whether debtors or creditors) were equally considered (Ebeid, interview – 1993). Moreover, it is the tendency in

most similar cases that, once the choice has been made and the results become visible as the system is installed, there is little chance to compare alternative systems and a natural tendency to defend the decision made. However, it was not the case for the DM&EM system due to the fact that it was a semi-tailored system that was designed and built via a cut and paste approach from a number of experiences. The main systems was the DMFAS with more additions and modification added (i.e developed and implemented) by the program team. The main reason for this was both issues of contextual (complex nature of the Egyptian debt stock) and cultural (language and other local culture related issues) fitting.

b. Used Systems Categorization:

We have observed that the DM&EM program management was quite convinced that the modified DMFAS system in addition to the developed sub system are cateigorized in the I/DSS category. Until this research was concluded we were not totally convinced that it complies with the basic characteristics of a DSS specially but rather a complex, interactive, query answering IS. Though we disagree with the DM&EM program positioning at that stage of development, we quite believe that by completing the other sub-systems[1] (explained in details in chapter V section D) and making them fully functional, this would represent a perfect example for I/DSS. The reason behind this is the fact that it will possess the capability of answering simple information queries (satisfying the characteristics of an IS) as well as being equally robust in responding to complex modelling inquires (satisfying the characteristics of a DSS also). In chapter III, we have used figure III-1 to graphically present the difference between TPS, MIS, DSS and ESS. In

[1] Some of its plan presented to us by the program team.

this chapter we will use the same figure (figure VIII-1) in order to diagrammatically present our point of view.

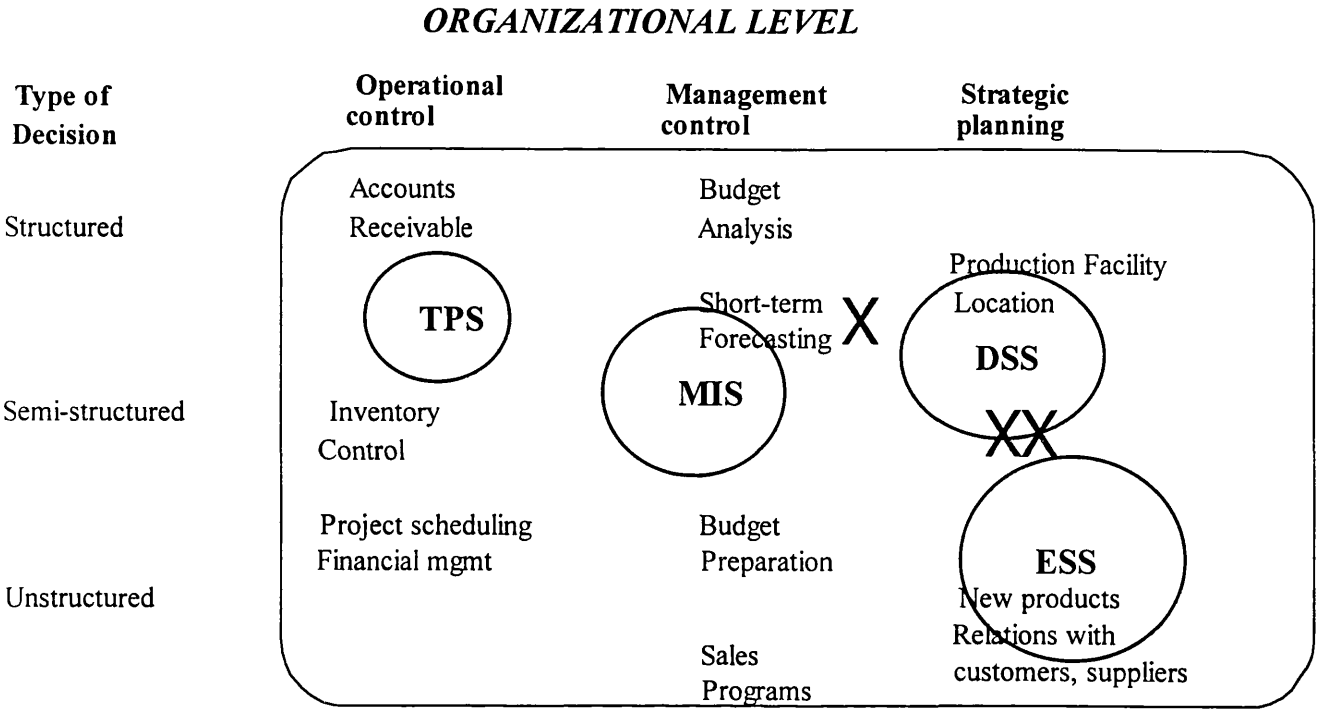


Figure VIII-1

Position of DM&EM system

Key: X DM&EM system at its present state

XX DM&EM system after completion of its other complementing subsystem.

c. Inadequate resources:

Normal I/DSS projects can suffer a great deal from lack of resources allocated locally or by external assistance projects so how about complex applications such as debt management? Human resources, equipment, and technical support seem to be the three main areas for which inadequate provisions are sometimes made. The failure cases Egypt has experienced before the DM&EM program were partially because of the above reasons (individually or together). For that reason, it was apparent to the Egyptian HLEC in general, and DM&EM

program management in particular, that the design and delivery of debt management I/DSS needed to be reviewed carefully in the light of similar experiences in other countries to ensure adequate / continuous resource allocations. In this respect, the DM&EM program had to carefully study available systems and experiences world-wide in order to optimize the "build and/or modify and/or buy" decision that needed to be made regarding the debt management I/DSS to be chosen (Kaddah, interview - 1993). It needed to take into consideration the unique / complex features of the Egyptian debt stock as well as the known challenges of a growing developing country.

d. Lack of expressed political will:

The DM&EM program team experienced a lack of appropriate direction from authorities to ensure that debt management activities were accorded a proper position in institutional priorities. This, of course, was related to the question of local resources allocated for debt management mentioned in point c. Though our research we have observed that during the initial stage of the program there was a lack of top level political attention and, as a result, inadequate resources, the scheduling to participate in the first Paris Club round (May 1987) made all the difference. Senior government officials became sensitized to the benefits that could be gained if appropriate attention was given to debt management I/DSS activities and were made aware of the importance of integrating such program into the debt management plan from the beginning. Therefore, one clear conclusion from this research is that building the awareness function is considered to be a very vital prerequisite for the success of an I/DSS program since it creates user's support as well as top level political will.

e. Staffing:

Another observed problem, which the program faced during its initial phase, was the selection of staffing from existing government staff. This staff was inexperienced and unskilled in program development and system use. Recruiting a high caliber of personnel from outside was next to impossible due to deteriorating working conditions in the government sector and the attraction offered by the private sector. The reasons behind these problems were typical of government institutions in developing countries. The situation was completely turned around once the attention of top level government decision makers was attracted to the benefits that this program could yield. The problems expressed above were almost completely done away with the addition of an incentives program to include opportunities for training, technical exchanges, and study tours abroad. Efforts to match remuneration to responsibility and productivity became a useful tool in this situation.

f. Training:

Problems with implementing the DM&EM program seemed to arise more frequently with respect to basic or introductory training related to computers, information systems, and debt rather than with more advanced, product - specific technical training. We have noticed that in addition to extensive training sessions and seminars, program team members were keen to attend regular, well-structured training programs offered by the Cabinet IDSC focused on the latest I/DSS technologies.

g. Hardware and software:

Generally, for the DM&EM program software and hardware availability was not a major problem, although in some cases hardware failures did

and still do occur. We have noticed that software problems tended to focus on missing functionality (i.e., features which were promised but which were not present or delivered on schedule), rather than on "bugs" in the systems. In addition, in a country like Egypt, localization issues, in terms of either language (cultural interface) or structure (to accommodate the complex nature of the Egyptian debt portfolio), and interfacing with other financial applications and systems both inside Egypt and between Egypt and other countries, posed significant challenges to the program team[2].

h. Other factors:

Other factors observed include the crucial need for development of a detailed plan for co-ordinating debt information management in the country and the serious attempt to avoid duplication of effort that could waste both time and resources as discussed in Chapter VII.

[2] Explained in detail in Chapter V

2. Debt Management & Economic Monitoring Program - Strategic Issues & Policies

Based on the analysis of the empirical research and the overview of the DM&EM program implementation phases, this section identifies the research findings in light of the major strategic issues and policies targeted by the program and their respective focus, objective(s) and output / impact. In the interest of clarity, we have tabulated them as follows:

STRATEGIC ISSUES & POLICIES	FOCUS	OBJECTIVE(S)	Output / Impact
1. Management of BOP.	• Establishing an interconnection between macroeconomic policy and the external debt burden • Foreign currency scarcity	• Management of external resources	• Maintaining economic stability while achieving growth
2. Sectoral loans demand	• Estimating future loans within the framework of the external and internal debt ceiling • Applying cost recovery / pay-back principles	• Establish a sectoral project evaluation system • Determine sources of loans (internal / external) in compliance with the national plan	• Successful management of national debt • Escape from payback bottleneck
3. External debt ceiling	• Defining ceiling in the state budget • Developing criteria for maximum amount of loans • Integrating all borrowing bodies in the economy	• Define the optimum borrowing volume • Establish an annual overall ceiling for external debt	• Control of budget fiscal gap • BOP management

STRATEGIC ISSUES & POLICIES	FOCUS	OBJECTIVE(S)	Output / Impact
4. Screening of new borrowing	Making decisions on renewed / restructured / more cost effective debts Defining gap in BOP i.e., potential volume of new borrowing	Generate / monitor new methods of financing / supply searching Control at the microeconomic level	Reduction of marginal costs on total borrowings
5. Negotiation for debt	Evaluating loans, needs, sources (prior approvals) Estimating future indebtedness Evaluating available sources	Establish loan evaluation system for comparison of loan opportunities Proper choice of available funds / conditions	Ensure full and effective utilization of loans (i.e., optimum utilization of funds).
6. Risk minimization	• Risk concerning: a. interest rate b. exchange rate	• Hedging the risk by choosing a. the optimum currency composition b. an adequate maturity structure • Minimum exposure to risk	• Proper debt portfolio management
7. Enforcing paybacks from the business sector	Incorporating debt in debtor budget Imposing commitment for reimbursement	Force debtors to payback on schedule by ensuring they include debt obligations in their budgets Follow-up on the pay-back process	Debt payback on an ongoing automatic basis

STRATEGIC ISSUES & POLICIES	FOCUS	OBJECTIVE(S)	Output / Impact
8. Debt re-negotiating	Specifying a profile for negotiation employing financing / trading approach Emphasizing low-risk refinancing	Handling debt negotiations inclusive of legal and administrative aspects	Integration of economic, financial and legal elements
9. Debt conversion schemes	Existing tools of debt swaps, debt equity, debt export New tools for debt conversion- notes/bonds	Reduction of external debt Extending maturities.	Relief of external debt

STRATEGIC ISSUES & POLICIES	FOCUS	OBJECTIVE(S)	Output / Impact
10. I/DSS implementation for strategic support	Leveraging decisions for top level decision makers Building a productive external debt management national function Responding to the Paris Club crises	Develop an accurate, timely scenario generating capability. Support high level economic committees and the Cabinet. Support negotiations with creditors, especially Paris Club affiliates.	Solid I/DSS debt management capability that acts as a base for a full-fledged debt management office Modified debt decision making process (including changes in roles and responsibilities) New positioning in terms of negotiation with creditors

C. Lessons Learned:

The experience gained during the empirical research work conducted on the DM&EM program, as well as the theoretical material covered for both I/DSS and debt management, revealed a number of critical findings:

1. The structuring of an issue (such as debt management) is an integral part of the design and implementation of I/DSS systems especially in areas dealing with national socio-economic development planning. The main reason for previous failure cases in implementing a good external debt management function was the detachment of the issue structuring from the design and delivery of the functional system (Kaddah, interview – 1993).
2. Providing I/DSS debt management systems for development planning is often coupled with both urgency and criticality of the issue. Therefore, debt management systems design should allow for crisis management modes of operation, which entails the preparation of crisis teams with managerial and technical support capable of operating in stress situations. Sometimes we are faced with pressure situations where creditors provide lucrative/non-lucrative offers however they need the debtor to answer back in hours (Sedki, interview – 1993).
3. Providing debt management systems requires much time and effort in building and integrating databases from multiple data sources and sectors (Ezz, 1993).
4. An effective I/DSS debt management system depends on the availability and accessibility of timely, relevant and accurate information (EL Sherif, interview – 1993). Before the program inception, though computers were available, information was

very much lagging, inaccurate and lacked responsiveness to inquiries (weeks or even months).

5. Continuous user involvement is an integral part of the success of any of I/DSS debt management system (Kattab, interview – 1993).
6. Successful implementation of I/DSS debt management systems is a necessary aspect, but not a sufficient condition, for successful institutionalization; both processes should be well integrated.
7. While successful implementation is based on top management support, successful institutionalization is based on organizational support (Hammed, interview – 1993).
8. Evaluation and assessment of I/DSS debt management systems is a vital process that should accompany all phases of implementation and institutionalization (Kaddah, interview – 1993). We have observed that the program management have adopted a very strict review and evaluation policy, which they used to run on weekly bases.
9. Continuous multi-level training of human resources leads to the successful adaptation, diffusion and adoption of I/DSS systems within various organizations (El Sherif and El Sawy, 1988). This was purely the case in the debt management program implementation (Ezz, 1993).

D. Generalization

This research is important for developing countries and specifically Egypt in that it has studied the positive and the negative impact of the DM&EM program at both the national level and the international level. It has also studied the direct and indirect economic and developmental planning effects on Egypt since its inception in 1987. At the theoretical level as well as the practical level, our research on I/DSS has measured the impact of its introduction on shaping and leveraging decision-making processes especially at the top strategic level. It has observed the changes in the roles and responsibilities that took place within the concerned institutions as a result of its realization. These changes along with other financial, technological and human infrastructure investments made in the program were thoroughly studied.

Based on the findings and the lessons learned from this experience, a set of recommendations / generalizations can be drawn for future implementation of similar I/DSS programs in similar contexts. The generalizations included in this chapter are based on the results of the research on the subject and on the unique findings of our empirical research, and encompass the following: proper management of foreign debt; optimum functional capabilities of I/DSS debt management systems; and lessons learned as a result of implementation.

1. Management of Foreign Debt

As we noted previously, developing countries resort to foreign financing to encourage internal growth and to increase the resources available for investment. It is important that, before receiving foreign funds, plans be made on how to repay them, and consideration be given to the

limits such debt will impose on future economic policy. Investment projects financed with foreign debt should yield enough foreign currency to cover the servicing of the debt. In theory, therefore, debt management involves knowing the level of the debt, keeping it within the desired limits, and obtaining the best available terms for it. In reality, debt management is very different for the following two reasons: First, public foreign debt has been used mainly to create (or maintain) fiscal deficits, caused not by greater public investment but by higher public current consumption or, in some cases, ambitious and unprofitable investments. Second, the volume of foreign debt incurred by any given country has usually been independent of the size of its current account deficit plus net foreign direct investment. The result has been a serious debt-servicing problem, the "debt crisis", attributable in most countries largely to the absence of debt management (Kattab, interview -1993).

Debt management should take place at two levels: the macro-economic and the administrative level. Macro-economic management is the most important since the management of the economy, as a whole is the main factor in determining the volume of foreign debt. When more borrowing can no longer cover debt servicing, it is recommended that one of two alternatives take place. One is to create a bigger surplus in the trade and service accounts by reducing expenditures relative to output. The other is to create a fiscal surplus, since in developing countries most foreign debt is owed by the public sector while most foreign assets are held by the private sector. The debt-service problem is, therefore, more a fiscal issue than one related to the balance of payments. Nowadays, turning fiscal deficits into fiscal surpluses could be called macro-economic debt management (IBRD, 1988).

Institutional management of foreign debt (figure VIII – 2) can be organized in a similar way in most countries, with minor differences due mainly to unique features in the historical formation of administrative institutions. The research review of some groupings of the institutional structure in selected countries, including Egypt, permits some broad generalizations.

The evidence of the institutional structures in the DM&EM program, as well as in programs in other selected countries such as Mexico and Turkey, forms the basis for the following presentation on efficient institutional management of foreign debt through prioritization.

The first institutional priority for foreign debt management is the statistical unit. This unit depends very much on the strength and the organization of exchange control regulations. Problems in ascertaining the level and characteristics of the foreign debt as well as the absence of exchange control leads to a lack of statistical control.

The second most important institutional priority is to have a control unit (Figure VIII - 3) for debt service and for foreign debt commitments and disbursements. The key factor in debt management is to be able to service the annual burden. The main priority is, therefore, to establish, through balance of payments forecasting, the level at which foreign debt can be serviced, and then to incur the foreign borrowing appropriate to that level. The only way to avoid the accumulation of debt service above sustainable levels is to control commitments and disbursements. The unit must have a global picture of the evolution and movements of external debt and its service to be able to make informed debt management decisions.

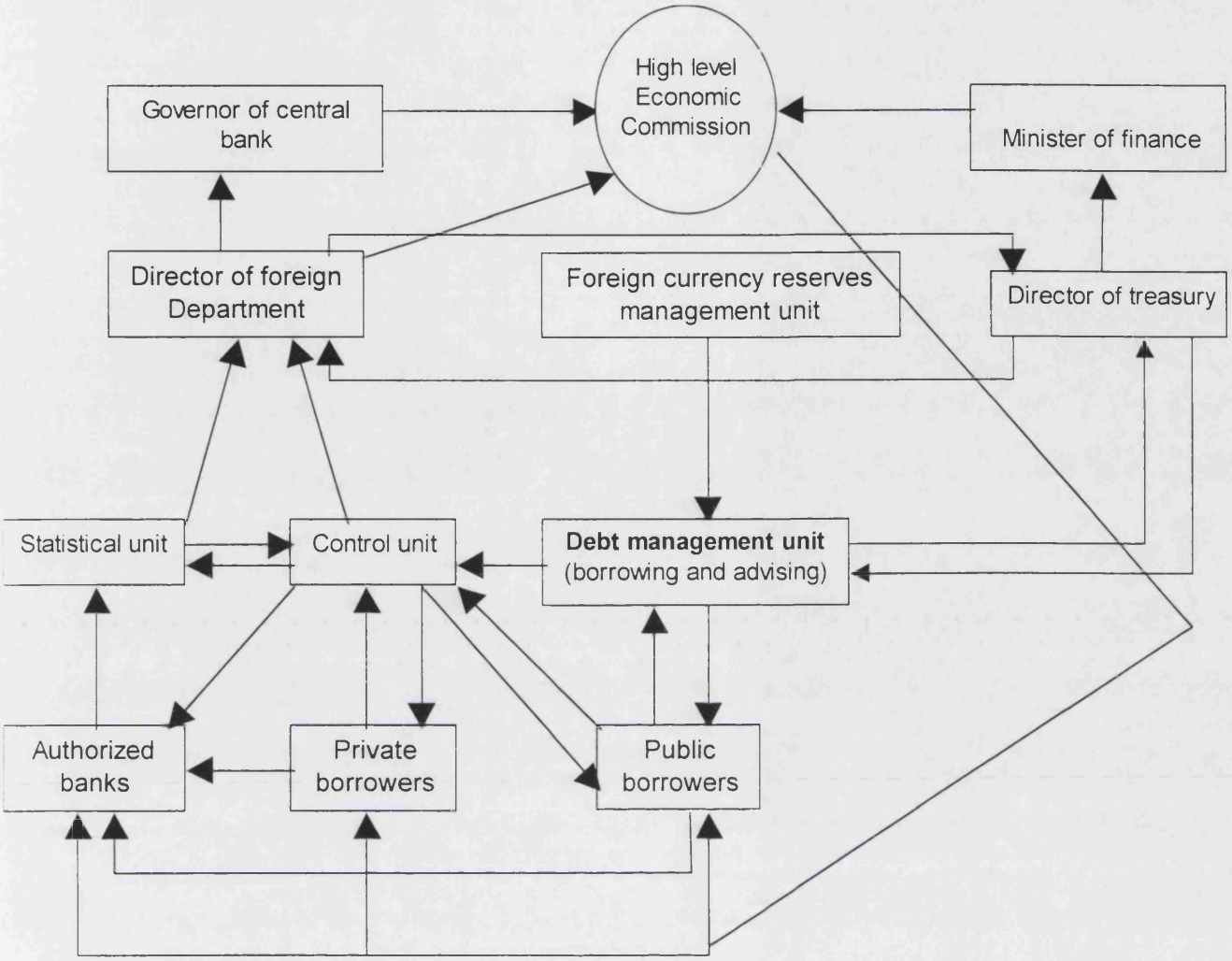


Figure VIII - 2

Proposed Institutional Management of Foreign Debt

An Information Flow Perspective

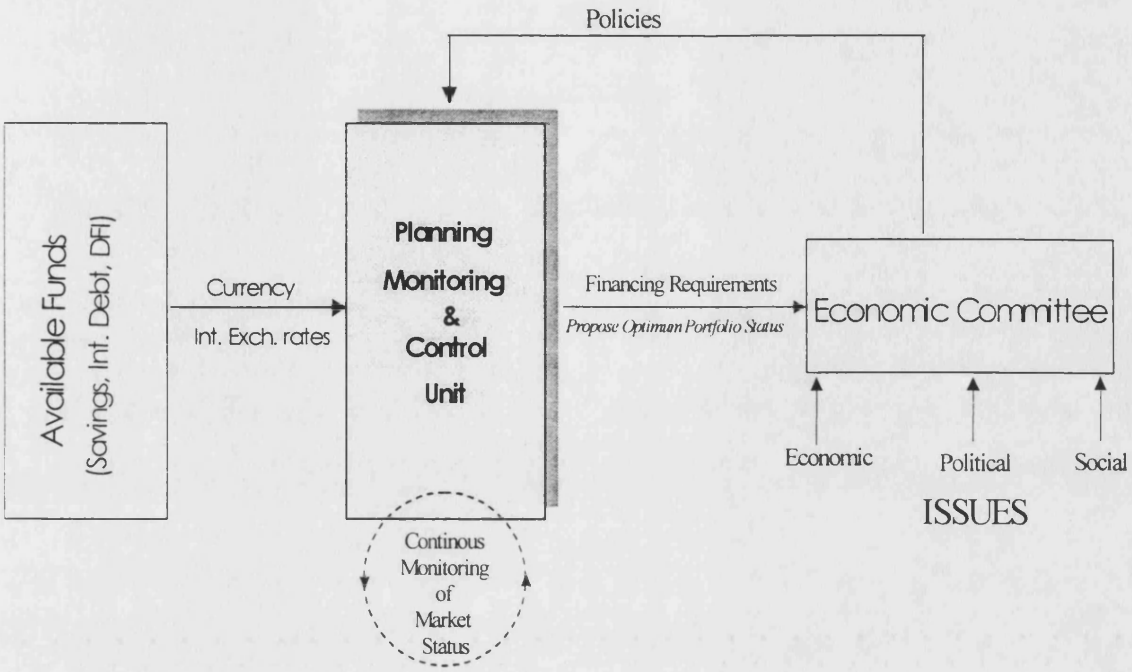


Figure VIII - 3

Proposed New Role for the Control Unit

A third institutional priority is an advisory unit (Figure VIII - 4). Most countries to date are following defensive or passive management of debt, which involves avoiding unsustainable debt servicing and foreign financial crises (Hussain, 1989). But active debt management consists mainly of the daily analysis of foreign markets and the study of future options. An advisory unit should be able to advise the government, public sector and the external borrowing approval committee, if one exists, on the best control mechanizmes so that they have adequate terms of reference for authorizing new borrowing. This advice is best presented in the form of generated scenarios, which illustrate the advice and its related impact. It is also this advisory group or technical secretariat (TS)[3] that provide debt management decision makers with the tools that help them formulate their inquiry and generate the

[3] For details on the Egyptian debt management technical secretariat please refer to Chapter V.

relevant response to the problem they are tackling from the angle they feel best suits the situation.

Another top priority is that the debt management TS reports to a high level committee (HLEC in case of Egypt). This committee should include high-ranking economic policy decision makers so that it has close connections with the decisions affecting monetary and fiscal policy. It should meet as often as possible to be able to adapt its recommendations to the changing conditions of both foreign capital markets and macro-economic performance.

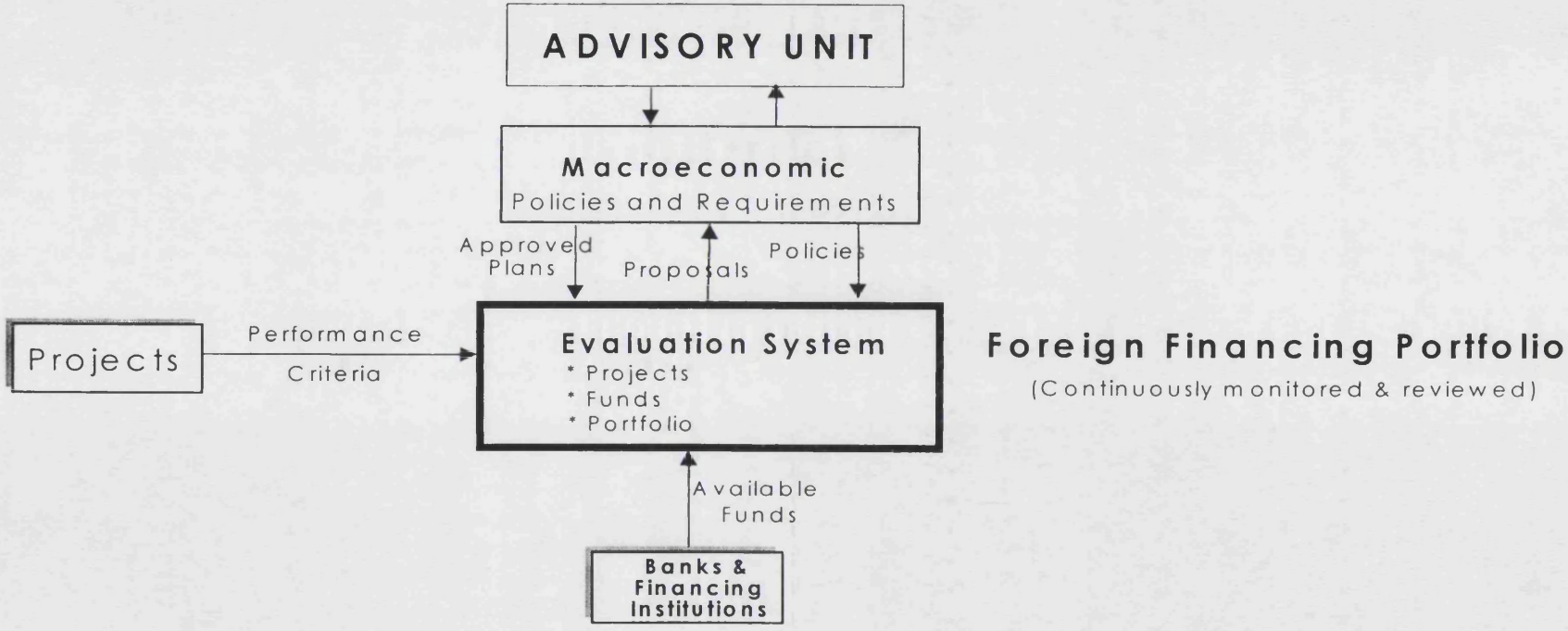


Figure VIII - 4

Proposed New Role for the Advisory Unit

Finally, one institutional problem that affects many countries is whether the Ministry of Finance or the Central Bank should be in charge of negotiating the central government and public sector borrowing, or whether it should be done only by the central government, leaving other government agencies and public sector companies to negotiate and manage their own foreign borrowing. From the experience of the DM&EM program the latter is the worst option to consider due to the haphazard manner that each individual borrowing agency will follow in addition to the duplication of effort, money, time and expertise that is required by each and every borrower. More important, in the case of public or publicly guaranteed debt, creditors are forced to claim back their money directly from the country if the debtor organization fails to service its own debt. The disastrous result is that borrowing is accomplished without any limitations and without consideration given to feasibility, usage[4], or payback. Establishing a single public borrowing unit that co-ordinated the debt acquisition process helps to negate most problems caused by mis-information problems as the unit progresses toward specialzation and the accumulation of skills and expertise in the debt management process (Figure VIII-5).

[4] It was found that almost 38% of the total loans borrowed by Egypt (prior to 1985) were not utilized until the maturity dates, Said Dr, Saleh Hammed - Deputy Prime Minister and Governor of the CBE (Interview, 1993).

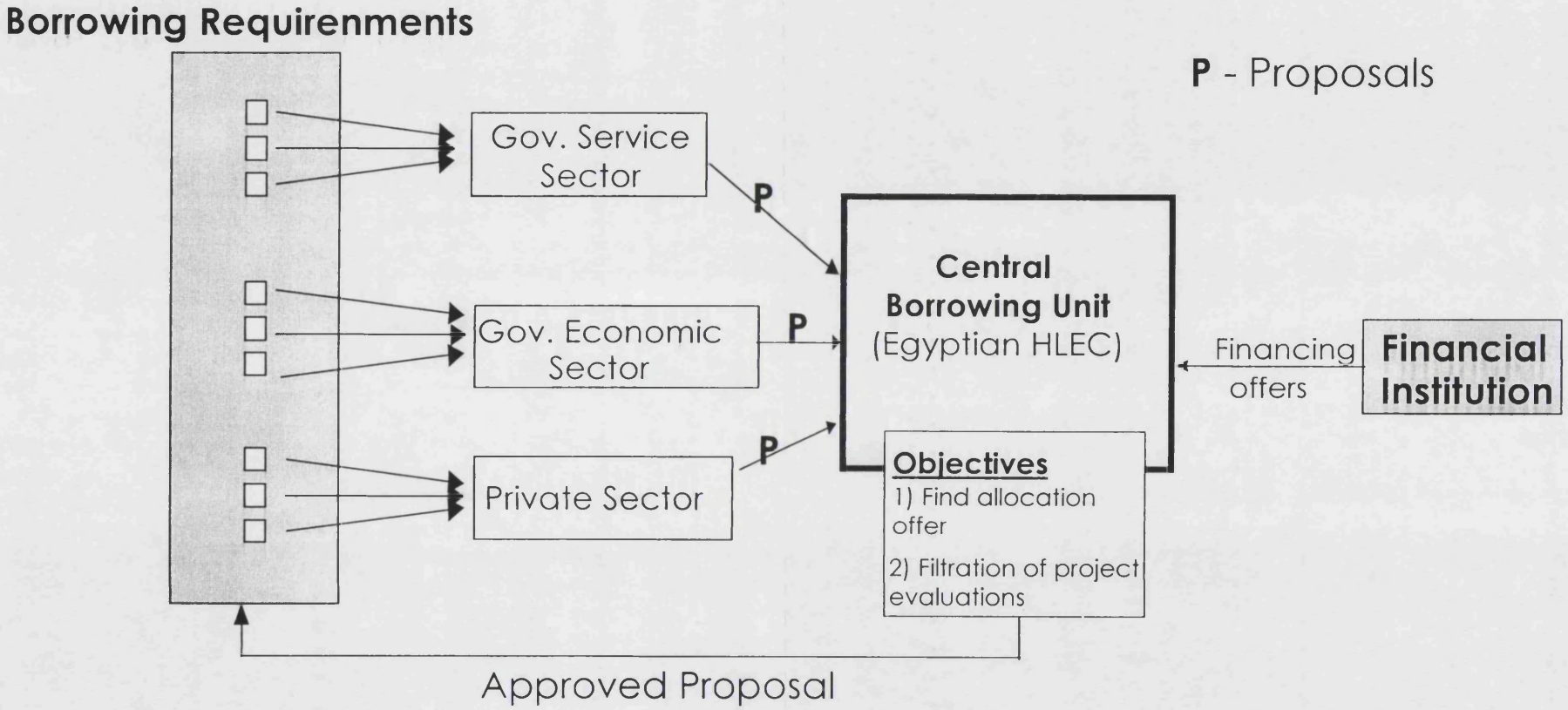


Figure VIII - 5

Proposed Central Borrowing Scheme

2. Optimum Functional Capabilities of I/DSS Debt Management Systems

I/DSS debt management systems vary a good deal in sophistication, complexity, and functional capabilities. The generalization process of the empirical research findings for the DM&EM program produced a list of I/DSS debt management functions. This list represents a collective view of a number of famous debt management experts[5] together with our own views and observations. For the purpose of testing our research finding observations (especially point b, section B of this chapter), we will articulate such list to satisfy such purpose: -

I. IS Functional Capabilities[6]:

a. Data entry, validation, and editing in order to create and maintain the components of the debt database. This includes what is commonly referred to as debt registration / recording and debt transaction accounting.

b. Production of standard reports, with varying degrees of user parameterization for record selection, aggregation, computing, and output formatting. Reports can be based on debt and data entered by the user, extracted from external systems, and/or generated by the debt management system. Reports can include single loan summaries and histories, ledger accounts, arrears notices, creditor exposure, external debt outstanding, debt service projections, country reports for the World Bank, various statistical aggregations, utility reports, etc.

---

[5] Mehran, 1985; Husain, 89; IBRD, 88; Kaddah, interview, 93; kattab, interview, 93; Ezz, interview, 93.

[6] These functions are not necessarily mutually exclusive.

c. Querying and ad-hoc reporting, including an interactive query program to enable selection of records meeting specified criteria and a reporting language or report generator permitting easy user definition of reports. Note that if user parameterization is sufficiently generalized, the "standard" reports in function B may be able to meet many of these requirements.

d. System utility and maintenance functions, including file backup, security, parameter initialization, etc.

e. Interfacing to external systems for the purposes of:

- Importing debt data (e.g., transaction information from an accounting system, exogenous data);
- Exporting debt data (e.g., aggregate data to a spreadsheet for inclusion in a macro-economic model);
- Sharing of common debt database elements or files with another system;
- Administrative and operational control (e.g., passing payment information to an authorization tracking system);
- Reporting debt data in machine-readable form to external agencies (e.g., the World Bank); and
- Accessing external financial or statistical information sources (e.g., Reuters, IP Sharp).

f. In the case of a supplied debt management systems package, facilities for customizing data structures, processes, and reports or for developing new functions which can be integrated with those already provided in the package.

g. Access to information sources for operational portfolio management, including:

- Market conditions including availability, instruments, maturities, etc. (see also Function e);
- Sources of finance; and
- Un-drawn amounts in existing loan.

h. Access to networking facilities for information exchange amongst debtors, including electronic mail and computer conferencing.

II. DSS Functional Capabilities[7]:

a.Generation of projected transactions are based on rules for periodic disbursements, payments and fees.

b.Analytic / management tools that support:

- Sensitivity testing, to determine the effect of variations in exchange and interest rates on future debt servicing;
- New loan testing, to evaluate loan offers or possible borrowing strategies;
- Calculation of the grant element in loans;
- Monitoring loan utilization and, to a limited degree, the use of loan funds in specific projects; and
- Integration of debt data and exogenous macro-economic data.

c. Facilitation of structural changes to the debt portfolio and database, resulting from:

- Refinancing, rescheduling and restructuring exercises;
- Debt servicing optimization via currency and exchange rate options and swaps; and

[7] These functions are not necessarily mutually exclusive.

- On-going lending operations.

d. Decision-support systems and tools, to assist in policy formulation; evaluation of alternative strategies; development of negotiation strategies; portfolio management and optimization of composition, maturities, and interest; and exchange rate exposure. Such systems would be sophisticated extensions of the tools included in Functions b and c and would use the collective expertise contained in the information sources in Functions e and g of the previous section.

e. Access to information sources (both within a developing country and from other countries) for policy formulation, regulatory functions, and debt co-ordination, including:

- Laws, regulations, procedures for authorization, contracting and administration of loans;
- Foreign exchange regulations and procedures;
- Examples of workable institutional arrangements;
- Economic and financial policies impacting on external debt management;
- Current international loan practices (e.g., what creditors can and cannot require, sample agreement clauses);
- New financial techniques and their implications for developing-country debt strategies;
- detailed experience in previous negotiations;
- Training opportunities; and
- Sources of technical advice (including consultants).

Note that Functions g &h (section I) and d & e (section II) are not widely considered as fully fledged parts of I/DSS debt management or of other operational support systems used by debt managers. Such functions (related information sources), as in the case of g and h, are

labour-intensive and demanding to construct and continuously maintain. Addition, functions g &h (section I) and e (section II) would partly depend on the development of good relations with technical assistance agencies such as the UNCTAD, WB, ..etc., in order to gain from their expertise in identifying, classifying, processing and sharing of information[8].

[8] See also Section D – 1.

E. Future Research

Challenges faced, experience developed, opportunity seized and lessons learned from DM&EM program implementation could help highlight some present gaps in the process of developing I/DSS debt management systems. It could direct future research to key areas, both in I/DSS as well as debt management that need further research exploration. The process of identifying such dependent and independent key issues supports the duplication of similar systems in similar contexts. The theoretical and practical experience gained from the thorough study of the DM&EM program can represent a transportable experience that could be used in similar situations by other countries. It reflects an insight for new areas of I/DSS application in non-profit and development-related government policies, decision making and management.

1.Present gaps in the development process of I/DSS Debt Management Systems:

We have observed that the DM&EM builders (designers, implementers, operators, etc.) are dealing with a dynamic rather than a static system. User requirements, financial practices and instruments, government policies and approaches, and computer technologies evolve and make new demands on their systems. Changes are sometimes dictated by internal system demands as well, i.e. the need to improve performance, reduce system overheads, replace obsolete development technologies and/or tools, etc.

Results from our empirical and theoretical research foresee the following three main areas in future systems development.

a. **Facilities for customizing data structures, processes, and reports or for developing new functions, which can be integrated with those systems already available.** *(IS related)*

To date, most users of DMS have been satisfied with using the package more or less in turnkey mode, although it does not fully cover their requirements. Additionally, principal DMSs provide some facilities for user customization, mainly during system installation; however, it is generally not easy to add data elements (for example to the loan file data definition) if a user wants to write a separate application program to access or manipulate the loan record. Moreover, with the increasing use of computer-based tools in all aspects of work, the demand for customized solutions and inter-connections between applications will tremendously grow.

b. **Decision support systems and tools to assist in policy formulation, evaluation of alternative strategies, development of negotiation strategies, portfolio management and exposure optimization of maturates, interest and exchange rate compositions.** *(DSS related)*

Currently, most DMSs provide the user with relatively limited facilities for constructing different scenarios and determining the effects of changes with various parameters on critical variables computed by the system. In its simplest form, user must generate the required variables (for example, by printing the associated reports or by computing and then exporting the variables to a spreadsheet), save the contents of the database, modify the parameters in question (often one by one), re-compute the variables, and compare the results. This can be a time-consuming and tedious process (although not as tedious as performing

the entire analysis manually). Determining optimum scenarios may require multiple repetitions of this procedure. Moreover, senior decision makers and/or less technical users of the DMS may require higher-level, more user-friendly interfaces to the system than what are currently available for asking such "what – if" questions. The construction of appropriate scenarios may also involve accessing external data sources of models, or indeed may require exporting data from the DMS for processing by external processes.

c. **Access to information sources for policy formulation, regulatory functions, debt co-ordination, and operational portfolio management and to networking facilities to update the content of these sources and to exchange information among debtors.** *(Institutional setting related)*

Research results and observations indicate a number of specific needs for information for policy formulation, regulatory functions, debt co-ordination, and operational portfolio management which could be better met by the systematic collection and organization of specific types of information. There could be a number of different methods for providing access to such information, depending on the source of the information and the existence of related systems and services already in place or planned. Clear examples are: database of laws, regulations, and administration of loans might be part of a national, legal or administration information system; Information may also come from external sources, such as commercial, financial or statistical services, and later may be analyzed and re-packaged to meet local needs.

At the regional or global level, there may be opportunities to establish or to participate in existing information systems and networks. Country-specific information can be shared via contributions to co-operative

databases, newsletters, and referral services. Thus, documentation such as publications, working reports, etc., for example, on workable institutional arrangements for debt co-ordination might be deposited with an existing regional development information system (such as PADIS in Africa or INFOPLAN in Latin America) for analysis, indexing, and inclusion in the system's databases and information products.

In case of any co-operative efforts to construct databases or exchange information records, standard methodologies may have to be created or adapted to format and index such information. Definitely, some of this information (such as experiences during previous negotiations) can be quite sensitive, yet potentially very useful to other developing countries in similar situations.

2. Key Areas of Future Research in Debt Management

Our research has generated a number of key potential issues and opportunities that represent directions and grounds for future research in the areas related to building, managing and sustaining I/DSS in economic development planning. We conclude this thesis with several questions and issues for the reader to consider and hope that our research will lead to further research in the field until all issues are dealt with and a DMS is as perfect as human kind can make it:

- What is the role of staffing, recruitment, and training of debt managers?
- What is their relative position in the government hierarchy; what are the skills required; the authority and powers they enjoy; and what is the access they have to decision-makers?
- How to capture, co-ordinate, and integrate the information flows originating from different agencies, departments, ministries, and the private sector without actually taking over those functions directly or even posing a threat to the agencies responsible for generating

primary data?

- How to properly provide policy makers with useful information and proper scenarios that are both timely and well-focused, and which can be linked with other economic variables, like the balance of payment and fiscal aggregates? So that policy makers can look at debt as part of a broad picture, rather than looking at the debt situation in isolation or in a compartmented manner.
- How to standardize data definitions and concepts, how to classify them into various categories that meet the multifaceted needs of users both internal and external, and how to develop standards and specifications that ensure the data are of acceptable quality?
- What is the appropriate role of external technical assistance in developing the local institutional capacity?
- What has worked in technical assistance, what has not worked, and what can be done to improve and strengthen the delivery of technical assistance?
- With an increasing number of countries running into domestic debt problems, does it make sense to continue dealing with external debt as a single entity or is there a justification for combining domestic and external debt management systems rather than keeping them on parallel tracks?
- Can successful debt management experiences be replicable / transportable?

Thesis Appendices

Appendix I-A

Macroeconomic Aggregates

The following are some macroeconomic aggregates:

- **Total External Debt (EDT)** which consists of public and publicly guaranteed long - term debt, private non - guaranteed long-term debt, use of IMF credit and estimated short - term debt.
- **Total Debt Service (TDS)** which shows the debt service payments on total long - term debt (public and publicly guaranteed and private non - guaranteed), use of IMF credit and interest on short - term debt only.
- **Export of Goods and Services (XGS)** are the value of goods and all services (including workers' remittances) sold to the rest of the world.
- **International Reserves (RES)** are the sum of a country's monetary authority holdings of Special Drawing Rights (SDR), its reserve position in the IMF, its holdings of foreign exchange and its holdings of gold.
- **Gross National Product (GNP)** is the broadest indicator in economic output and growth. It covers the goods and services produced and consumed in the private, public, domestic and international sectors of the economy. It also provides the overall framework for analyzing and forecasting economic trends. It has the unique attribute of integrating the markets for goods and services (demand and spending) with production of the goods and services (supply or costs) in one format.
- **Imports of Goods and Services (MGS)** is the net transaction of a country's imports of goods and service in a given period.

Definition of Debt Indicators:

- **Total External Debt to Exports of Goods [EDT/XGS]**

Higher external debt relative to exports that earn foreign exchange, indicates a higher debt payment burden that undermines growth prospects and the ability to import. A country with a high debt burden relative to exports may choose to impose foreign exchange controls to limit outflow of funds and grant export subsidies.

- **Debt Service to Export Ratio [TDS / XGS]**

Countries are ranked from low ratio values to high values. Higher values indicate greater amount of interest and principal payments on external debt as compared to the foreign exchange cash - flow generated by exports. A country whose foreign exchange earning exports are low relative to debt payments may have to lower domestic business activity and imports to economize on foreign exchange.

- **International Reserve to Total External Debt [RES/EDT]**

International Reserve assets are composed of foreign exchange, gold and special asset allocations from the IMF. Such reserve assets are means of servicing debt. Higher external debt relative to reserve holdings indicates a lower liquidity cushion and a greater likelihood that the government will impose reserve-building austerity policies that economize on imports and encourage exports.

- **International Reserve to Imports of Goods and Services [RES/MGS]**

Reserves can be used to pay for imports necessary to sustain economic performance. Higher reserve holdings relative to imports indicates borrowing or policy adjustments such as exchange rate devaluation. The following graphs elaborate on how to put debt indicators into direct application. (For examples on Egypt, please see chapter VI, page 209).

Appendix II-A

Interviews

Preliminary Questions[1]

1. What are your qualifications (highest education /work experience)?[2]

2. What is your perception of the metaphors strategic, tactics and operations management levels? And how do you perceive their inter-relatedness and the effect of each level on the others? Do you think that people belonging to one management level perform functions at other levels?

3. What are the types of data and levels of detail / aggregation required by your?

4. What is the extent to which your depend on assistance from advisors and /or support staff? And what exactly are their roles?

5. How do you perceive the role of the project in the overall economic reform program?

6. Do you deal directly with project personnel or through an intermediary?

N.B. Depending on the results obtained from the above questions, the pattern of

---

[1] The purpose of the preliminary questions was to identify the management level of the interviewee via a defined set of criteria in the form of questions that would allow us to objectively place him in the right management level, based upon his management pattern of behavior as a decision-maker and not depending of his official post and/or management hierarchy.
Some of these questions might need clarification for the jargon used (e.g., what is a strategic level). In this respect simultaneous explanation and interpretation of the terminology used is carried out depending on the immediate feedback of the interviewee when the question was asked.

[2] Depending on the level addressed, information could be a obtained from a question like this. Usually for top level persons, we depended on indirect sources of information such as personal bio, C.V., assistant, etc.

behavior and management practice of the interviewee will be determined. Consequently, each management level will be targeted with one of the following questionnaires.

Questionnaire - Strategic level

1. Did your participate in setting-up the mandate of this project?

2. How often do you depend on the support of the project in shaping your decision making process? And to what extent is it useful?

3. What is the type / kind of support that your receive from the project?

4. Could your give us an idea of how the strategic decision making process used to take place before the inception of the project?

5. Did your realize a kind of change in the pattern of the decision making process as a result of the project and its deliverables?

6. What were the number of major success / failures before and after the project? And what were the main reasons behind them?

7. How can you classify the outcome of the project from the point of view of impact on the overall economic reform program?

8. What is your degree of satisfaction on the performance/ deliverables from the project?

9. How did your perceive the issue of having a PC with the latest daily money and banking market update (either local or international) in the form of an EIS on your desk? And how often do you use it? Did your have any formal orientation?

10. Are all the issues, problems and ideas supported by the project initiated by your?

11. To what extent does your share in the development and build-up of a scenario? Does this imply that the project is premature, mature or post-mature?

12. What are the areas that need further development and / or restructuring in the overall project mandate?

13. How can we improve the effectiveness of the project in order to achieve its desired national/international mandate?

14. In your opinion, how can we institutionalize this project in the future?

15. Finally, can we say that at a certain point in time our debt management experience could be fully transportable to other countries? And if yes, how?

Questionnaire - Tactics level

1. What was the main reason behind initiating the project idea? And how did it evolve?

2. Who identified those reasons and asked for this kind of assistance?

3. Could your give us an idea of how the strategic decision making process used to take place before the inception of the project?

4. Did your realize a kind of change in the pattern of the decision making process as a result of the project and its deliverables?

5. What are the strategic objectives of the project?

6. What is the scope of the project?

7. Are all inquires / services initiated by the project?

8. According to the project conception, what is the basic philosophy behind the metaphor "supporting and/or shaping/leveraging high level decision makers" ? Is there more than one type ?

9. Who are the main users and targeted beneficiaries? And what is the philosophy adopted in satisfying their needs?

10. What is the degree of user involvement? And in what form?

11. Can you give us an idea of the modalities of project implementation?

12. What is the status of the project to date?

13. What were the main reasons behind the successes / failures?

14. Can you shed some light on the outcome / deliverables of this project?

15. What was IDSC's role in this project? And what was its degree of involvement?

16. Could you give us an idea on the project structure, human power and workflow procedure?

17.Could we say the outcome of the project is impact on the process of decision making? If yes, how and to what extent?

18.What was the impact of the project on the organization, national and international levels?

19.What do you think of the project experience? And to what extent could this idea be transportable / re-transferred to other contexts?

20.In your opinion, what are the project plans?

Questionnaire - Operations level

1. When did you join this project?

2. Being a XXXX (post), how would you describe your work?

3. Did you perceive a change in your job tasks/functions and assignments before and after the project introduction?

4. Did you perceive a change in decision maker's management pattern (decision making process) after the introduction of the project?

5. Did you receive any kind of training on or off the job? If yes, in what areas specifically and was it adequate?

6. What was the environment / platform used in implementation?

7. Were tailoring and adaptation functions (arabization and other functions) a must? And who requested it? And why?

8. What is the breakdown of the system? What are the technical specifications of the system? How many phases of implementation were there?

9. How often do you participate in the overall planning of the project?

10. Was there a role-played by international experts and consultants? And if yes, what specifically did you gain from them?

11. What were the main difficulties / problems faced during implementation?

12. Who can you define as your target users? And what is their degree of involvement?

13. Can user requests be classified and /or categorized?

14. Did the user have any orientation on the use of computers before? And if yes, in what areas and was it adequate / beneficial or not?

15. What were the modalities used in their training?

16. What are the detailed steps followed in receiving and delivering a user request?

17. Do you perceive a change in the work performance before and after project introduction? If yes, in what sense?

18. Could you give us an idea on how you perceive the future of the project?

Appendix II-B

Four Point Lickert Scale

Four Point Scale Supplementary Questionnaire Sheet

(Version IV)

You are kindly requested to respond to the following statements. Most of them are accompanied by either examples or explanations for facilitating this exercise and assuring that the meaning is clear in your mind. In addition, each one has a scale of points from 1 to 4. Point 1 on the scale represents complete disagreement, while point 4 on the scale implies complete agreement. In between answers range from disagreement to agreement with at levels (1 = complete disagreement; 2 = disagreement; 3 = agreement; 4 = complete agreement). Best of luck and thank you in advance.

Four point Scale				***Statements***
1	***2***	***3***	***4***	
				• Regardless of his organizational hierarchy, decision-maker's qualificat-ions (education and work experience) affect his management pattern of behavior[3].
				In other words: Education background and work experience influence a decision maker's mode of operation regardless of his organizational hierarchy i.e. hierarchically positioned at a strategic level while performing tactical and /or operational management functions.

---

[3]Management and /or decision making pattern of behavior are used interchangeably in this text. The purpose of using them is to classify decision-makers and their pattern of behavior when dealing or handling a situation that requires a certain decision or action to be performed. According to management practices, there are a number of different combinations for such patterns such as, strategic level decision-makers who are global in nature and depend heavily on advisors and support staff. On the other extreme, we have strategic level decision makers that do not believe in the global picture and like to drill down searching for facts and proofs for what they are after. Most of these categories are either very visionary and can see things which others cannot envision or are, usually, not satisfied by what has been provided by their advisors / support staff. The same applies to decision makers on the tactical and operational levels.

Decision maker's organizational hierarchy or post does not necessarily indicate his management pattern of behavior.

For example: A Minister or an Under Secretary position does not necessarily indicate that he is performing strategic decision making.

- Decision makers at any hierarchical level in the organization can perform management functions in any other level depending on a set of variables.

For example: A decision maker at a strategic hierarchical level (such as a Minister) can perform management functions in any other level depending on a number of variables such as, the situation faced, nature of problem at hand , the character of the decision maker himself, etc.

- A good indicator for a decision maker's pattern of behavior could be the type of data and level of details he uses.

For example: If a decision maker is usually dealing with very high level (aggregate) data, the global picture and few minor details, his management pattern of behavior could be classified as strategic.

- Users of the debt management and economic monitoring project perceive it as a critical success factor for the economic reform program.

  For example: Key members of the Cabinet HLEC, who represent the core user group for the project, regard the debt management and economic monitoring project as a fundamental factor of the success and achievements reached to date by the Egyptian economic reform program.

- The project has successfully delivered a number of products and services that shaped and leveraged the decision making process on a macro-economic level.

For example: Project products such as, the comprehensive data base, scenario generators and information bulletin. Project services such as information / decision support services have successfully helped and supported the process of decision making especially macro-economic ones.

- The concept of 'supporting the decision making process' [4] was clearly understood and grasped by the management of the project who were able to successfully provide products and services that helped key decision makers such as members of the HLEC.
- The introduction of the project and the continuous enhancement of its outputs and services have significantly leveraged the process of decision making of top policy and strategy people.

- The non-conventional project setup has significantly contributed to its success to date.

In other words: The management style adopted, the qualified personnel employed, the flexible organizational structure, the non-government environment set-up (i.e., running the project as a strategic business unit with clear objectives and goals, using highly qualified staff in addition to utilizing external (international / local) expertise and advisors).

- Special requirements were necessary / a pre-requisite for the success of modifying the ready-made systems and the build up of the complementary ones.

For example: Special requirements such as clear overall vision of what needed to be done, well coordinated objectives and goals between different management level of the project personnel, etc.

---

[4] Enabling decision makers to perform the right decision at the right time through building and providing accurate and timely information in addition to computer-based decision support scenarios which reflect the spectrum of solutions to a certain problem besides the impact of each one if selected.

- The project has reached its ultimate phased objectives and succeeded in fulfilling its mandate to date.

- The failures that the project faced are negligible.

In other words: They were mainly due to the build up of the unique learning experience by project personnel and also the awareness of its client base.

- The project services offering pattern is still more inclined to the side of supply driven approach.

- Continuous user involvement has greatly helped in shaping and fine-tuning the project's mandate, objectives, scope and deliverables.

- The project has more to deliver in order to reach its institutionalization stage.

For example: Establishing the debt ceiling system, financial and capital market system, debt strategy module, the internal debt system, etc.

- The cumulative experience of project personnel is solid enough to be exported to other contexts (countries and institutions).

- The continuos training and exposure to latest state-of-the-art information technology tools and techniques have greatly shaped the output and service level of the project.

- The rate of success reached by the project to date is highly coupled with the role and effort exerted by IDSC in supporting and facilitating its mission.

Appendix II-C

Interviewee List

• Ebied, Atef, Egyptian Minister of the Public Enterprise Office & Minister of State for Cabinet Affairs, November 24, 1993, Cairo, Egypt.
• El Ezz, Izzat A., CBE – LEDD Director, Interview, October 24, 1993, Cairo, Egypt.
• El Sayed, Khaled, CBE – LEDD Technical Manager, Interview, October 24, 1993, Cairo, Egypt.
• El Sherif, Hisham, The Cabinet, IDSC Chairman, Interview, May 18, 1993, Cairo, Egypt.
• Ghali, Youssef Botrous, Egyptian Minister of International Cooperation, Interview, November 8, 1993, Cairo, Egypt.
• Hamed, Salah, Egyptian Deputy Prime Minister and Governor of the Central Bank of Egypt, Interview, October 8, 1993, Cairo, Egypt.
• Kaddah, M.B., DM&EM Program Director & Member of the Paris Club Negotiation Team, Interview, February 18, 1997, Cairo, Egypt.
• Kattab, M.A., IDSC – DSS Department Director, Interview, July 15, 1993, Cairo, Egypt.
• Nazif, Ahmed, IDSC Executive Manager, Interview, July, 24 1993, Cairo, Egypt.
• Sedki, Atef, Egyptian Prime Minister, Interview, October 24, 1993, Cairo, Egypt.
• Wassif, M. Makramalla, Egyptian Minister of International Cooperation, Interview, October 6, 1993, Cairo, Egypt.

Appendix III-A

DECISION SUPPORT SYSTEMS

A. DSS

1. Difference between MIS, DSS, and EIS:

The development of inexpensive, powerful microcomputers was stimulated by equally powerful advances in software design which furthered the principal goal of DSS: to provide tools to end-users. Simultaneously, MIS systems have added many DSS features and have attempted, with limited success, to adopt more user-friendly software, giving end users direct control over sessions. While all of these advances have been positive for end users and managers, they have made the job of researchers and scholars more difficult because the distinctions between DSS, MIS, and EIS use are difficult to make (Turban, 1988).

Table III-A-1 attempts to summarize the differences between MIS, DSS, and EIS. DSS has been placed between MIS and EIS to suggest that DSS is a bridge between them.

Table III-A-1

Differences between Management Information Systems (MIS), Decision Support Systems (DSS), and Executive Information Systems (EIS)

Dimension	Conventional MIS	DSS	EIS
Focus	Information processing	Analysis, decision support	Status access
Typical users served	Middle and lower levels, sometimes senior executives	Analysts, professionals, managers (via intermediaries)	Senior executives
Impetus	Efficiency	Effectiveness	Expediency
Application	Production control, sales forecasts, financial analysis, human resources management	Diversified areas where managerial decisions are made	Environmental scanning, performance evaluation, identifying problems and opportunities
Database(s)	Corporate	Special	Special
Decision support capabilities	Direct or indirect, support, mainly structured routine problems, using standard operations, research, and other models	Supports semi-structured and unstructured decision making; mainly ad hoc, but some repetitive decisions	Indirect support, mainly high-level and unstructured decisions and policies
Type of information	Scheduled and on-demand reports; structured flow, exception reporting of mainly internal operations	Information to support specific situations	New items, external information on customers, competitors, and the environment; scheduled and on-demand reports on internal operations
Principal use	Control	Planning, organizing, staffing, and control	Tracking and control
Adaptability to individual users	Usually none; standardized	Permits individual judgment, what-if capabilities, some choice of dialog style	Tailored to the decision-making style of each individual executive, offers several options for outputs
Graphics	Desirable	Integrated part of many DSS	A must
User-friendliness	Desirable	A must if no intermediaries are used	A must
Treatment of Information	Information is provided to a diversified group of users who then manipulate it or summarize it as needed	Information provided by the EIS and/or MIS is used as input to the DSS	Filters and compresses information, tracks critical data and information
Supporting detailed information	Inflexibility on reports, cannot access the supporting details quickly	Can be programmed into the DSS	Instant access to the supporting details of any summary

Model base	Standard models are available, but are not managed	The core of the DSS	Can be added, usually not included or limited in nature
Construction	By vendors or IS specialists	By users, either alone or in combination with specialists from the IC or IS Department	By vendors or IS specialists
Hardware	Mainframe, micros, or distributed	Mainframe, micros, or distributed	Distributed system
Nature of computing packages	Application oriented, performance reports, strong reporting capabilities, standard statistical financial, accounting, and management science models	Large computational capabilities modeling languages and simulation, application and DSS generators	Interactive, easy access to multiple databases, online access, sophisticated DBMS capabilities, complex linkages

Philosophically, DSS and micro computing are identical in that professionals largely dominate both: Users receive information from a professional staff of analysts, designers, and programmers.

In terms of their objectives, MIS focuses on structured information flows to middle managers. DSS is aimed at top managers and operational managers, with emphasis on change, flexibility, and quick response. With DSS there is less of an effort to link users to structured information flows and a correspondingly greater emphasis on models, assumptions, and display graphics. Micro-computing tends to focus on automating well-defined, specific tasks (e.g., document preparation and spreadsheet analysis.) Until recently, there was little concern with systematically tying microcomputers into corporate or external data flows, although this situation is now changing.

Perhaps the greatest differences can be found in systems analysis and design. Micro-computing is almost entirely dominated by packages. Users establish their needs and buy a package, but then are limited to changing the capabilities of the package. If information requirements expand, users must buy a new package. Analysis and design are done by end users.

Both DSS and MIS rely on professional analysis and design. However,

whereas MIS follows a traditional systems development life cycle, freezing information requirements before design and throughout the life cycle, DSS systems are consciously interactive, are never frozen, and in a sense are never finished. At the other extreme, EIS systems are highly graphical and use many indicative and tailored techniques to match the decision-maker's style.

While these differences among MIS, DSS, and EIS are true in general, there are many exceptions. For instance, microcomputer spreadsheet and database packages can be programmed (or menu driven) by end-users to support a wide variety of decisions. Microcomputers can therefore provide the platform for developing a MIS, DSS and EIS.

2. Support for Decision Making at Different Levels

While many early DSS were aimed at senior management, many users of DSS are found at middle-management levels. There are many reasons for this, but experience indicates that a well-designed DSS can be used at many levels of the organization. Senior management can use a financial DSS to forecast the availability of corporate funds for investment sorted by division. Middle managers within divisions can use these estimates and the same system to make decisions about allocating division funds to projects. Capital project managers within divisions, in turn, can use this system to begin their projects, reporting to the system (and ultimately to senior managers) on a regular basis how much money has been spent.

3. Support for Organizational (Group) Decision Making

It is wrong to think that individuals make decisions in large organizations. In fact, most decisions are made collectively. (Rational, bureaucratic, political and "garbage-can" models of organizational choice were discussed in Chapter III). Frequently, decisions must be coordinated with several groups before being finalized. In large organizations, decision making is inherently a group process, and DSS can be designed to facilitate group decision making.

DSS are uniquely suited to support a number of organizational processes, such as decision making and political competition. As previously noted, DSS are highly flexible and can support a number of different assumptions and decision processes. An organization wide DSS should permit different groups, using different assumptions, to analyze the same problem and come up with interesting, unique answers (Henderson and Schilling, 1985).

B. Framework for Developing DSS

Developing a DSS requires new kinds of tools, a different concept of who is involved in building systems, and new organizational arrangements.

1. DSS technology

DSS technology can be divided into three levels. The application system level technology is called specific DSS. This includes the hardware and software that decision-makers use to guide their decision making. A Lotus spreadsheet used to make financial projections and test assumptions is a specific DSS.

A second level of technology is called DSS generators. A Generator is a package of related technologies, both hardware and software, that provides the tools for building specific DSS. Mainframe systems such as Boeing's Executive Information System (EIS), IBM's GADS system, the Execucom Systems Corporation's Interactive Financial Planning System (IFPS), and EXPRESS, marketed by Tymshare, are all examples of mainframe software DSS generators. These packages contain data management, graphic display, financial and statistical modeling, and query language capabilities. More recent additions to this market are decision analysis systems that employ selective artificial intelligence qualities to help decision-makers arrive at decisions and summarize the results.

DSS generators have experienced tremendous market growth since the arrival of microcomputers. Integrated spreadsheet packages, database packages with graphics, and related graphic support tools are examples of DSS generators that can be used to develop a large number of specific applications. A more fundamental level of DSS technology is a DSS tool. These are the building blocks of generators. Included are special purpose languages such as APL, which permits the radical development of applications, screens, menus and

interactive dialogue. Also, it includes graphics subroutines of language, special purpose graphics hardware and supportive telecommunications hardware. Each of these levels of technology involves a different set of roles.

2. Roles:Users, Builders, and Toolsmiths

Along with the development of end-user computing and the growth of more user-friendly mainframe software, a number of new roles have emerged in the organization that link technical specialists with professional systems staff on the one hand and with a user group on the other. DSS entails a more elaborate division of labor and more specialized roles.

Five roles are involved in DSS, each related in a unique way to the technologies previously described (see Figure III-A-1).

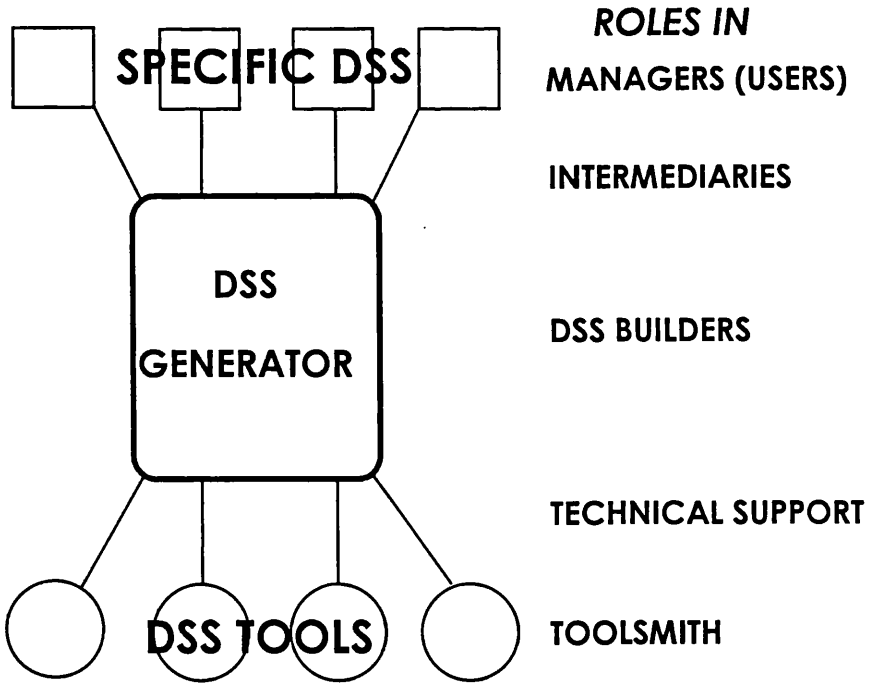


Figure III-A-1

Roles and Tools in DSS

(Source: Sprague and Carlson, 1982)

1. The manager or end user is the person or group ultimately responsible for making key organizational decisions. This person or group operates in an environment of uncertainty and faces bureaucratic constraints and political competition in the effort to reach on organizational decision. A DSS must provide information on how things are progressing, help to design alternatives, aid the user in arriving at a decision that others will support, and finally facilitate that implementation.

2. The intermediary is a skilled staffer who helps to schedule the manager or task force's workload. This person plays an important gatekeeper role by determining what problems come to the attention of the manager, what information is presented, and how it is presented, and is influential in scoping the solution.

3. The DSS builder is generally a member of a special DSS group who uses a DSS generator to build the capabilities desired by end users. This person must be familiar with the business problem but must also have a keen understanding of how to make the technology work (although he or she need not necessarily understand how it works). This occupational role has seen the largest growth (and has experienced the greatest shortages) of any role described here.

4. The technical supporter is a member of the data processing group or department who develops or installs DSS generators and tools. DSS require links to corporate databases, graphics software, display hardware, and a host of highly technical facilities.

5. The toolsmith is a member of the data processing staff who develops new technology, new graphics, and new software to serve DSS applications. Toolsmiths often work for private vendors that develop DSS packages or for service bureaus that deliver DSS services, rather than for end-user organizations. This person is most often a computer scientist or systems engineer.

C. The Process of Developing a DSS

Building a DSS is different from building a Transaction Processing System (TPS) or MIS system. DSS generally use smaller amounts of data, do not need on-line transaction data, involve a smaller number of important users, and tend to employ more sophisticated analytic models than other systems. Because DSS are customized to specific users and specific classes of decisions, they require much closer participation of users. In addition, they must be flexible and must evolve as the sophistication of users grows. In order to build effective DSS, a new strategy and design process is needed.

1. Strategy

There are many different ways of developing DSS, each suited to different conditions. These options include "quick-hit" development of a few specific DSS, phased development of a related series of specific DSS, and development of a full-service DSS generator (Sprague and Carlson, 1982).

The quick-hit approach essentially involves scanning the organization to find easy, rapid development opportunities, characterized by willing users, a well-understood problem, and readily apparent, fruitful approaches using information technology, in short, low-risk, high-payoff development. Hopefully, the required tools and techniques can be purchased from a vendor and applied directly.

The problem with this approach is that development tends to be unplanned and ad-hoc (a virtue becomes a vice). Different DSS are developed, with no sharing of capabilities or experience. The specific DSS constructed have no general capabilities and may not be adaptable to future problems, forcing total re-design in the near term.

The quick-hit method is the most conservative and most popular approach to DSS development. It does not require a central DSS group, users can develop systems as needed, and the short-term

investment is minimal (although the long-term one may be more expensive).

The staged development approach attempts to build a string of specific DSS, one at a time, but in a coordinated fashion that involves the sharing of software; hardware, and, most important, expertise among projects. Generally, this approach requires a central corporate DSS group. The DSS group has the opportunity to engage in a systematic program of development, while appearing to work on only one project at a time. Therefore, this strategy seems conservative but is in fact more ambitious. The disadvantages of this approach are a delay in developing the first system and the risk that later systems cannot use the technology of earlier ones. There may not be a synergistic effect in which later systems build on earlier capabilities. Nevertheless, this is the second most common approach to DSS development and the most common one wherever the organization has a DSS group.

The most ambitious strategy requires senior management support for the development of a DSS generator or general DSS capability prior to developing specific DSS. This is essentially a multi-year effort, perhaps requiring up to three years with current technology. The effort focuses on developing a powerful set of tools, an integrated DSS generator, and supportive hardware and physical facilities. A few large companies have taken this approach. The Egyptian Cabinet's DSS structure is one example of a powerful organization-wide commitment to DSS (for a detailed example see Appendix IV-A, p. 42). While this approach has the advantage of taking a long-term, coherent view of DSS, it runs the risk of encountering technological and market obsolescence (e.g., the fall in the price of microcomputers in the last few years).

There is no one best strategy. The strategy chosen should be linked to the organization, the users, the tasks, and the builders. If we divide

strategies into two groups, the less ambitious and the more ambitious, it is clear that a more ambitious strategy is possible for a firm that has had considerable experience with information technology, has identified tasks receptive to this approach, and has supportive users and willing builders. Any organization where one or more of these conditions does not exist should select a less ambitious strategy.

2. Analysis

In the traditional systems life cycle, analysis is concerned with two stages: project definition and systems study (in which the old system is critiqued and a new system proposed). The end result is a list of information requirements and the broad outlines of a future system.

But the purpose of DSS is not to deliver a system in response to a specific set of information needs. Its purpose is to deliver a set of process independent capabilities. These capabilities are referred to as representations, operations, memory aids, and control mechanisms (the ROMC approach). The purpose of systems analysis in DSS construction is to identify a problem and a set of capabilities that users consider helpful in arriving at decisions about that problem.

How can we identify a problem receptive to DSS techniques?

- First, users should identify problems. Hence, users must have some knowledge of DSS techniques;
- Second, there must be a body of data to work with and analyze;
- Third, the problem must be one for which no simple formula provides a solution;
- Fourth, there must be some systematic way of thinking about the problem (graphs, lists, charts, operations, etc.) that a DSS can automate or assist; and
- Fifth, the problem must be important enough to engage the time and energy of management groups ranging from first-line

supervisors to senior management. Hopefully, the amount of time that is spent deciding on the problem using traditional methods can be estimated. The analyst should try to show how a DSS could reduce management costs.

What kinds of capabilities should be considered? The ROMC method directs the analyst to specific capabilities. For example, representations may include a list, a graph, a cross-tabulation, or virtually any symbolic conceptualization of a problem that can be represented in two or three dimensions. Representations should be kept simple. Maps, pie charts, PERT charts, and tabular data entry forms are examples. Representations should not confuse the viewer; they are intended, after all, to clarify. A seven-dimension regression equation is probably not simple enough.

Typical operations are the ability to plot, scale, and draw, forecast, print, and display any data in the system. Other implicit statistical functions include the basic arithmetic operations, means, standard deviations, correlation, and regression.

Memory aids distinguish DSS from simple micro computing. DSS have databases both internal and external to the organization; they have workspaces and the ability to profile data, to trigger alarms when critical values in streams of data are exceeded, and to manipulate data files (merge, join, sort, etc.).

Control aids are user-friendly front-end languages, example use of function keys at terminals, and a menu-driven capability, as well as the ability to run commands for experienced users (turning off the menu). A DSS generator has all of these capabilities. A systems analyst then need only select those that are specifically needed for a given system.

3. Design

In the traditional systems life cycle, design involves the development of detailed logical and physical design specifications of the system, programming, and installation. The major product of the design is a system that meets a specific list of requirements.

But in DSS there is no list of information requirements, and initially the user does not know what the final system will look like. All of the vital features of the system that are decided up front in the traditional life-cycle methodology are decided at the end in DSS design.

DSS must therefore use a dynamic (changing, evolving) method that is iterative (repetitive). The reasons for this are several. The users do not know and cannot specify in advance the functional requirements of the system. They need an initial system to react to. Their perception of the problem or the task will change as experience with the system grows. The users themselves change as they learn. They themselves cannot agree on how to handle a task or problem. Hence different users want different systems. With DSS, the trick is to know how to design a system under these conditions of uncertainty, disagreement, and differences in style. What is needed is a system that can be customized for a large number of users.

Iterative design utilizing prototyping is the solution; it has three stages:

- **Stage 1.** To develop a small, stable simple system that will fit on the user's desk, if possible. No complex analysis is involved. The user and the designer simply spend an afternoon together, with the user describing the problem and the designer creating screens (representations) of it on the spot until the user has selected a number of representations that appear to be useful. Here early analysis and early design occur all at once.
- **Stage 2.** To refine, expand, and modify the system in a series of cycles. In each cycle the analyst/designer re-analyzes the problem, designs new elaboration of the system, implements

them for the user, and evaluates their use. The user participates directly in establishing the technical capabilities of the system.

- **Stage 3.** To evaluate the system after each cycle. The use for a DSS can disappear as a problem disappears. Continual evaluation is a key virtue of DSS. Users must ask: does the system help me? Does it save time? Are my decisions more effective and if so, how? Is the DSS better than nothing at all? The DSS staff must ask: Is this DSS a worthwhile use of our time? Is the company receiving value for the effort? How can we quantify the value of making more effective decisions?

4. Implementation

In the traditional systems life cycle, the information system staff, after gathering information requirements, essentially disappears from the user area for several months. A system is then designed to meet the information requirements and is delivered on a certain date to the user area. Then a period of implementation begins. This can be a crumbling experience for users and systems personnel alike. The users may discover that the system is not what they wanted and may be shocked at certain aspects. The designers, who may not have interacted with the users for a long time, may become defensive and insist that the system work exactly according to specifications.

The entire situation is often characterized by enormous communication and language (jargon) gaps.

With a DSS there is no separate implementation stage. The system is always being implemented and, therefore, in a sense, is never implemented. It continues to grow. As a DSS goes through iterative cycles, users and systems personnel are in daily contact. The users see the system develop before their eyes. There is generally little opportunity for communication gaps to develop and no opportunity for

any party to be shocked by the other's work.

Additionally, there are certain elements of implementation that tend to stabilize a DSS. Implementation involves developing documentation on the system. An important problem with DSS is that they develop in a totally ad-hoc manner. There must be documentation on applications to ensure transportability and user-independent existence.

Implementation also involves developing a training program. Most end users will be keyboard literate, but most will need training in the specific DSS syntax, operations, controls, and representations. This is also an ideal opportunity to educate users about the role of DSS and to search for new DSS applications.

Finally, implementation involves an ongoing process of system evaluation and tracking. User surveys, observations, recommendations, and usage patterns are all-important ways in which a DSS can be evaluated. These data can be especially useful to the DSS group, clarifying its contribution to the firm, helping it to understand what users like (and dislike), and allowing it to identify problems in its internal operations and personnel.

D. A dynamic systems development life cycle for DSS

The different purposes and requirements of DSS that distinguish them from TPS and MIS systems lead to the differences in analysis for DSS and design methods previously described. There are also large differences among DSS. Some are very large efforts involving important organizational actors; others are small, involving only a few managers in a single division. Therefore, the life cycles for different kinds of systems will vary accordingly. Figure-4 presents an overview of the iterative DSS life cycle, which provides for several different variations.

Full-scale, organization-wide DSS may continually cycle through the thirteen stages of the DSS life cycle shown in Figure III-A-2. However, this situation is rare. The vast majority of DSS are smaller, ad-hoc, and specific. These systems will go through trimming cycles. This life cycle can follow many different paths, depending on the complexity of the system. The emphasis is on iteration and flexibility of design to meet changing conditions and new perceptions of requirements.

Prototyping and exploration of management decision making are perhaps the most powerful DSS techniques and have a great advantage over traditional development methods.

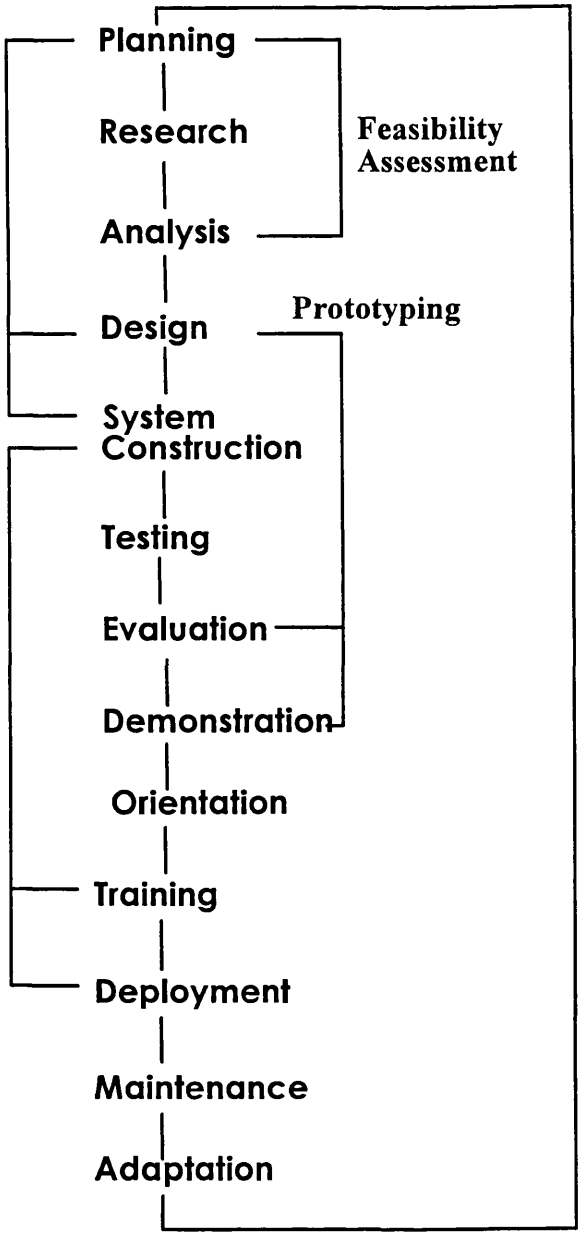


Figure III-A-2

Development Life Cycle for Simple DSS

Source: Meador and Keen, 1984

Appendix III-B

Debt Management and Debt Management Systems

A. Debt Management Functions[5]

As briefly discussed in Chapter II, debt management functions are grouped into executive and operational debt management. Executive debt management includes policy, regulatory and resourcing functions, while operational debt management includes recording, operating and controlling functions.

1. Executive Debt Management

The **Policy Function** involves the formulation of national debt policies and strategies in coordination with the agencies with prime responsibility for the economic management of a country. Broad policy considerations determine a country's sustainable level of external borrowing. This, in turn, is affected by the flows that the country can use efficiently and the ways it can generate the additional foreign exchange earnings needed to meet the service charges without risking external payment difficulties. These ramifications of foreign borrowing mean that external debt policy affects national planning, balance of payments, budget management, and all government agencies that determine the type of investment undertaken in a country. The major output of this function is a well-defined and feasible national indebtedness and external debt strategy.

The **Regulatory Function** of debt management involves the legal, institutional, and administrative arrangements for external debt management. It involves the establishment of a well-defined

[5] Proceedings of a seminar on external debt management, jointly organized by the Islamic Research & Training Institute of the Islamic Development Bank, Jeddah, Saudi Arabia and the World Bank Washington D.C., USA Jeddah, May 12 - 16, 1990.

regulatory environment to provide for the well-coordinated and, where necessary, centralized administration of external indebtedness at the level of recording, analytical, controlling, and operating functions, supported by efficient information flows. The major output of this function is the establishment and continuous review of the administrative and legal framework that specifies organizational responsibilities, rules and procedures among units involved, legal reporting requirements, etc. This is the organization structure. It will in large measure define the degree of control exercised and the data which can be recorded.

The **Resourcing Function** makes sure that the recording, analytical, controlling, and operating functions are performed by qualified staff. It involves recruiting, hiring, motivating, training, and retaining staff. At times, it might involve the hiring and supervising of outside consultants to provide for specialized technical expertise in particular areas such as computerization, debt audits, or preparation for rescheduling negotiations. This function must also be understood very broadly as the provision of adequate material resources (office space, communication equipment, etc.). The main output can be termed Staffing and Means.

2. Operational Debt Management

The functions pertaining to operational debt management, particularly the recording, analytical, operating and controlling functions, are performed on two levels: the aggregate Level and the dis-aggregated level of single transactions. The distinction is not always easy to make but is necessary for a better understanding of debt management.

The **Recording Function** requires collecting detailed information on debt on a loan-by-loan basis. The fundamental decision to make in devising a recording framework for external debt is to decide what constitutes external debt and which data will be collected. The data

collected on a loan-by-loan basis will be aggregated to provide statistics for analytical purposes. The main product of this function is information, on both the aggregated and dis-aggregated levels.

Very closely related to the recording function is the **Analytical Function**, which is a major consumer of the information provided by the former function. At the aggregate level, it involves macro-economic analysis to explore the various options available, given economic and market conditions, ad the future structure of external debt. It keeps under constant review the impact of various debt management options on the balance of payment and the national budget. It helps to form a view on such matters as the appropriate terms of new borrowing. At the dis-aggregated level, the analytical function looks at borrowing instruments, the choice of maturities, etc., and assists in the analysis of new financial techniques such as conversion schemes. The output here of course is analysis.

The **Operating Function** involves a whole range of activities related to borrowing and other agreements or arrangements that imply some kind of action (interactions and transactions). This function might be segmented into three different phases: negotiating, utilization of loan proceeds, and servicing. The activities or actions involved in each phase will be quite different depending on the type of borrowing involved (bilateral and multilateral concessional loans, Euro-credits, etc.). It thus deals with techniques, among which must be included those providing some form of debt reorganization (such as restructuring or refinancing). In recent years, new techniques have come into existence that fall under the heading of debt conversion schemes (debt-for-nature swaps, etc.). The products of the operating function are thus debt operations: negotiation, utilization and service. (These terms must be understood as broad categories. The actual interactions and transactions taking place will depend on the type of borrowing).

The **Controlling Function** is the function of debt management that is the most difficult to define separately. Indeed, control is intrinsic to a debt management system. While the recording, analytical, and operating functions are described here in their "pure form", it might be argued that control is embedded in those functions. Notwithstanding this and at the risk of becoming too abstract, separating the controlling function enriches the conceptual approach undertaken here and emphasizes the central role of this function.

At the aggregate level, the **Controlling/Coordinating** function is essential to ensuring that operational debt management is in accordance with executive debt management. Strategy may, for instance, impose statutory limits or overall guidelines on how much borrowing can be done by the public sector or by the country as a whole. The controlling function must ensure that borrowing is kept within these limits.

At the transaction or dis-aggregated level, the **Controlling/Monitoring** function is more concerned with specific operations, such as negotiations, utilization, and service. It must ensure, among other things, that the terms of new borrowings fall within current guidelines, that the funds are being utilized in time and used appropriately, and those repayments are made according to schedule.

In practice, the degree of control can vary widely (according to the different classes or types of debt and debt operations, the different classes or types of debt and debt operations, the different public-or private-borrowing entities involved, etc.). It can range from close control to coordination and monitoring.

B. Overview of CBDMS Software Packages and Suppliers

In terms of a complete, ready-to-install CBDMS (including software, standard data structures and definitions, training materials, and documentation), there are two systems which have been installed in at least 20 developing countries, UNCTAD'S DMFAS, and the commonwealth Secretariat's CS-DRMS. In addition, there are other CBDMS packages and components out of which a customized CBDMS can be constructed. Some of these systems and suppliers are given below as follows:

1. American Management Systems (AMS) - CDMS:

The comprehensive Debt Management System (CDMS) is a mainframe-based system developed for use in one Latin American developing country. Its supplier has indicated that the system could be customized for other country's requirements.

2. CEGOS - SIGNE :

This software, produced by IDET-CEGOS, a French consulting firm, is a microcomputer-based system. It has been constructed using a commercial proprietary database management system, DBase III. The system has been installed in several African developing countries in conjunction with assistance from a program, ADETEF (Technology Transfer in Economic and Financial Administration) supported by the French Government.

3. Commonwealth Secretariat - CS-DRMS[6] :-

The Commonwealth Secretariat's Debt Recording and Management System (CS-DRMS) is a microcomputer - based CBDMS developed by the secretariat's Technical Assistance Group. The system is under ongoing development and enhancement, and is installed (or is soon to

[6] Advisory Services on External Debt Management, Technical Assistance Group Commonwealth Secretariat, London.

be installed) in more than 25 countries. Data handling is provided by a commercial proprietary database management system, INFORMIX, which provides flexible access to the data for ad hoc querying, reporting, and potential development of new applications programs.

4. Interafricaine de Conseil et d'Assistance (ICA):

ICA, a company established by two Central Banks (Central Bank for West African States) has developed a microcomputer - based system based on its experience in several African developing countries.

5. Morgan-Grenfell :

Debt Recording System. Morgan-Grenfell developed a mainframe based batch system for its use in processing medium and long-term debt for its clients. It is currently not marketing this software, but is concentrating on advice to its clients on specific financial exercises and transactions; in the course of providing such advice, various computer-based tools may be used.

6. Peat Marwich Mitchell-Sovereign Debt System:

Peat Marwick Mitchell has developed microcomputer based systems modules, which can be tailored to a particular country's requirements. The main components are a trade debt system, a restructuring system, and a debt profile system. The software may be provided in conjunction with management consulting and advisory work undertaken by Peat Marwick Mitchell in a country.

7. Price Waterhouse-AFIXIEX:

AFIXIEX (Analyses Financiere de Dettes Interieures et Exterieures) is a micro-computer based package, components of which are operational in several African developing countries.

8. PROGRAMATOR:

PROGRAMATOR, a Swedish consulting company, uses its Indigenous Business Analysis Approach to develop customized systems for debt management and financial analysis.

9. SINORG - National Debt Management Package:

This microcomputer-based system was developed by SINORG (Societe Internationale d'Etudes de Recherches et d'Organisation), and is composed of four management modules: loan agreements, markets, debt service, and debt environment processing.

10.Troika-DAMS[7]: -

The Debt Analysis and Management System (DAMS) was developed by an Advisory Group (the Troika) from Kuhn Loeb Lehman Brothers International Inc., Lazard Freres, and S.G. Warburg and Co. Ltd. as an integral part of financial advisory services provided to governments. This minicomputer-based system (operating on PDP-11 and VAX computers) was originally developed for use by Troika banks in their work with clients, but it was later modified to allow countries to operate it themselves. These banking origins are evident in the level of detail supported by the system, detail that may be beyond the requirements of sovereign developing country debtors. The system is installed in several countries, but there is one main operational system in a developing country. The software is not being actively marketed, as the emphasis is on advisory work, and the system would normally be provided only in this broader context.

[7] Debt Analysis and Management Systems "DAMS", S.G. Warburg and Co. Ltd., London, January 1987.

11. UNCTAD-DMFAS[8]:-

UNCTAD's Debt Monitoring and Financial Analysis System (DMFAS) is composed of 3 main components: The Debt Monitoring System (DMS), which operates on mainframe computers, minicomputers, or microcomputers; the microcomputer-based Debt Aggregation System (DAS), which uses a proprietary commercial database system, DBase III; and the microcomputer-based Debt Project System (DPS), which uses a commercial proprietary spreadsheet system, Lotus 123. The system is under ongoing development and enhancement and has been installed in more than 20 countries. It is worth mentioning that this system is one of the most widely used CBDMS available and that some users have added more features to allow for scenario generation and a policy support feature.

12. World Bank:

Although the World Bank does not currently distribute a software package for developing country debt management, it does provide technical advice on various aspects of debt management computerization, especially in the context of assisting countries to meet their reporting requirements to the World Bank. The Bank is in the process of developing its own microcomputer-based CBDMS, initially for demonstration and training purposes, and is currently developing a distribution strategy for it.

[8] UNCTAD Debt Monitoring and Financial Analysis System, UNCTAD/MFD/45/Rev.1, UNCTAD, Geneva, November 1985.

Appendix IV-A

Central Bank of Egypt's LEDD Work Flow and Procedures[9]

Table IV-A-1

Statistics on the number of External Civil Debt Data Sheets and Reports received from Different Data Sources and Their Frequencies

Data Source	No. of Forms	No. of Data Items	Data Frequency
1. Commercial Banks			
- Direct Loans	300	300	Monthly
- Suppliers Credit Facilities	60 – 70	600 - 700	Monthly
- Banking Credit Facilities	60 – 70	600 - 700	Monthly
2. Ministry of Finance	10	250	Quarterly
3. Ministry of International Cooperation	20 – 30	500 - 750	Quarterly
4. CBE - Cairo Branch	30	750	Monthly
5. CBE - General Foreign Affairs Dept.	30	300	Monthly
6. General Financial Notes Dept.	4	40	Monthly
7. Other Ministries and Authorities	200 – 250	2000	Monthly
8. American Embassy (data on US debt	20	400	Quarterly
9. General Audit Authority Report (for revision)	200	200	Yearly

[9] Hassan, Ashraf. Case study for the CBE's workflow and Procedures, July 1993, Cairo, Egypt. The reflects the status of CBE-LEDD workflow and proceedures prior to the inception of the DM&EM program.

Table IV-A-2

Statistics on Periodic Reports Distribution by Concerned Agencies

Report Name / Concerned Agency	Direct Loans	Suppliers Credit Facilities	Banking Facilities	General Loans	Foreign Deposits	Resch-eduling	Distribution Frequency
1. The Cabinet	*	*	*	*	*	*	***Monthly***
2. Ministry of Economy	*	*	*	*	*	*	***Monthly***
3. Ministry of Planning	**Aggregated Report for the Minister**						***Monthly***
4. Ministry of Finance	**Aggregated Report for the Minister**						***Monthly***
5. Ministry of International Cooperation	*	*	*	*	*	*	***Monthly***
6.General Audit Authority	*	*	*	*	*	*	***Semi-Annual***
7. CBE- top Management	**Aggregated Report for the Governor**						***Monthly***
8. IMF	**According to the Instruction of the CBE Top Management**						

Agency Name and Address: ..... **Form no. 1 "Loans"**

To Loans and External Commitments General Department - The CBE

Request for acquiring CBE approval for committing to a direct loan or supplier's credit in foreign currency for more than one year according to Internal Law No. 1 Loans on 29/8/1978.

Data on loan or facility :

- Concerned "external commitments" committee's approval date : ----------
- Loan or facility commitment date : ----------
- Loan or facility duration : ----------
- Value in foreign currency : ----------
- Name of borrowing agency : ----------
- Loan or facility purpose : ----------
- Interest rate price : ----------
- Other burdens :----------
- Grace period :----------
- Repayment period :----------
- Repayment start date : ----------
- Number of installments : ----------
- Installment value : ----------
- Name and address of concerned local bank : ----------

Remarks:

1. This form must be prepared for each loan or facility exclusive ly on an original and two copies.
2. It must be clearly specified whether it is a loan or a credit facility

Date: / / 197 **Signature of responsible person and Concerned agency stamp**

The bank has no remarks on the cost of financing and terms of the above loan or facility data.
It was registered in our books under the following number: ----------
It is to be fully understood that the concerned borrowing agency has to complete all arrangements and procedures needed for putting the loan / facility in action.

Date: / / 197 **Loan and External Commitments General Department - CBE**

Figure IV-A-1
Data Collection Form No. 1, Loans

Agency Name and Address: ..... **Form no. 2 "Loans"**

To Loans and External Commitments General Department - The CBE

Request for registration for an assigned part of a government loan granted from -------- ---------- to the Government of Egypt represented by the Ministry of Planning and International Cooperation

Loan Information:

- Government loan commitment date : ----------
- Loan assignment date : ----------
- Loan number : ----------
- Value of assigned portion : ----------
- Lending agency name : ----------
- Loan purpose : ----------
- Interest rate price : ----------
- Other burdens : ----------
- Grace period : ----------
- Withdrawal start date : ----------
- Withdrawal end date : ----------
- Number of installments : ----------
- Installment value : ----------
- Name and address of concerned local bank : ----------

Remarks:

1. This form must be prepared for each loan or facility exclusively on an original and three copies.

Date: / / 197 **Signature of responsible person and concerned agency stamp**

Registered at the CBE under the following number: ----------

Figure IV-A-2
Data Collection Form No. 2, Loans

Date : / / 197 **Central Bank of Egypt - CBE**

Loan and External Commitments General Department

Loans / Facilities Registration no. :

Value : ---------- Commitment date : ----------
Purpose : ---------- Borrower : ----------
Interest rate price : ---------- Lender : ----------
Other burdens : ---------- Local bank : ----------
Grace period : ---------- Proforma invoice no.: ----------

Serial	Maturity Date	Installment Value		Interest Value		Remarks

Figure IV-A-3

Sample Registration Form

Appendix IV- B

The Egyptian Cabinet Information and Decision Support Center (IDSC)[10]

A. IDSC Organizational Structure

The organisational structure of IDSC was developed according to the environment of operation in which IDSC is involved. Therefore, it necessitated a special organisational structure together with the availability of managerial and technical human resources having the knowledge, experience and ability to cope with such a dynamic and turbulent environment. In this respect, its organisational structure includes:

Crisis management[11], priority assessment, and quality control teams to prioritise strategic issues in the Cabinet agenda and to assure the production and delivery of quality information and decision support services.

The **decision support services department** to deal with information and decision support requests from various ministries, governorates and local organisations. Its role is the identification of users' needs, issue formulation, definition of information and decision support requirements and the provision of possible sets of alternatives and solutions to these issues.

The **project development department** to respond to the needs of the different ministries and governorates. The department staff is the projects account executives whose role is to develop, implement and monitor various projects.

The **information resource management department** to represent the technical staff of the organization. Its role is to respond to different users' needs with respect to systems design, development, installation and maintenance.

---

[10] El Sherif, H. and El-Sawy, O., 1988.

[11] El Sherif, H., "Building a Crisis Management Strategic Support System", Advances in Telecommunication Management, JAI Press Inc., Vol. 3, 1990, pp 35 - 52.

The **information technology-tracking department** to continuously track and diffuse state-of-the-art information technology internally within IDSC and externally within different ministries and governorates through different projects.

The **human resource development department** to deal with the training of the IDSC staff as well as the staff of various organizations with which IDSC has joint projects. The training includes a set of programs and courses in management, information systems and computer applications. The objective of the training program is to diffuse the knowledge and use of information technology.

The **international co-operation department** to deal with IDSC's external interactions with international organizations and work on formulating joint informatics projects with various countries.

The **finance and administration department** to deal with financial, administrative, and legislative issues regarding both internal and external operations. Moreover, it is responsible for the development of steps and procedures to be adopted during the implementation of different informatics projects.

The role of the IDSC differs according to its four operational levels: the cabinet, sectoral, national and international. At the Cabinet level, the IDSC provides information and decision support, crisis management support, modelling and analysis of various high priority issues and multi-sectoral information and database development. At the sectoral level, the IDSC provides assistance in the development of decision support systems/centers, advisory and consultancy in the area of information and decision support services, sectoral databases development and project financing and support. At the national level, the IDSC provides assistance in policy formulation and drafting; legislative reform support; and in the human and technical infrastructure development. At the international level, the IDSC provides opportunities and facilities for technology transfer to Egypt as well as technology re-transfer to

developing countries. It perform this through the establishment of decision support systems models for socio-economic developmental issues[12].

As an organization IDSC evolved quickly from three persons in 1985 to over 370 managerial, technical and administrative personnel in 1995. These staff members are providing information and decision support services to the Cabinet in socio-economic development planning. The number of IDSC projects has increased steadily until it reached 195 in 1995, covering an expansive variety of economic, social, managerial and technological domains that are of vital importance to sustainable development.

B. IDSC key projects and programs[13]

Following is a set of decision support systems that were developed by the IDSC to improve the decision making process with regard to development planning[14].

1. An Illustrative List of IDSC Projects

Project	Purpose
Debt Management Project	To aid debt rescheduling negotiations
National Budget Project	Budget execution monitoring and reporting
National Resources Project	Evaluate impact of government policies, options and decisions on use and development of natural resources
Customs Reform Project	Evaluation of proposed tariff change options to maximize customs revenues and minimize conflict between different ministries

[12] El Sherif, H., "Managing Institutionalization of Strategic Decision Support for the Egyptian Cabinet", Interfaces, 20,1, January-February 1990.

[13] El Sherif, H. " Managing Large Information and Decision Support Systems Projects," IFORS Conference Proceedings, Buenos Aires, Argentina, August 1987.

[14] IDSC Brochure, Cairo - Egypt, 1993.

Project	Purpose
Ministry of Tourism DSS Project	To provide statistical information and budgetary control for tourism companies, hotel and tourism investment projects
Ministry of Electricity DSS	Provides statistical data about power, energy generation and consumption
Legislation Project	To provide information on various laws and decrees enacted at various levels
Public Sector Financial Information Project	Monitoring performance of all public sector units
Ministry of Education	A database on number of students, schools, teachers and classrooms for planning education infrastructure
Studies Information Systems Project	A database of 45,000 research studies conducted by various organizations to increase utilization of such studies
International Trade Information Project	International database on trade opportunities, company profiles, trade statistics collected from a world wide link of Egyptian trade representative offices
Governorates Project	Establishing a decision support center in 26 governorates to enhance effectiveness of administration and regional development

2. Profile for Key Projects[15]

Some key projects that are considered to be successful by IDSC are profiled in this section. The debt management project, which addresses a key area of concern, has already provided significant payoff in Egypt's debt negotiations with the Paris Club. The trade information system is expected to help in Egypt's export effort. The legislature database is to provide support for bureaucracy. The Governorate information system is to improve the administration of its social programs.

[15] El Sherif, H. and El Sawy, O., 1988.

a. The TradeNet Project

The TradeNet Project was started on 1 January 1986 as a collaborative venture between the IDSC and ITC, a Geneva based organization specializing in trade-related computer systems. The original objective was to manage import procedures so as to achieve a ten percent reduction in costs through better management of logistics and sourcing. In 1988-89 the objectives were revised to focus on promotion of exports.

The project is headed by an Masters of Business Administeration and has a staff of eight people of whom three are in marketing, three in operations (also responsible for identifying data sources) and one at the help desk. These staff are full time employees of the TradeNet Center which is an operational unit distinct from the IDSC. The IDSC has provided two professionals for software development work.

The TradeNet system allows importers, exporters, trade organizations, and government authorities to access databases that have been created on Egypt and 85 countries of the world.

Data is available on 136 socio-economic indicators for 20 years, on exchange rates, prices, market overviews, trade opportunities, company profiles, trade statistics, and international trade fairs and exhibitions. A variety of intelligence reports are provided. These relate to price index, inflation, and purchasing power of different markets. They also cover commodity situation in terms of production forecast and price. Access is provided to international databases such as Data Star, Dialog, Info-line, IP-Sharp, Reuters, Minitel, and ICC-Geneva.

Input for the databases is collected from several sources such as databases created in other IDSC applications, trade journals, magazines, and government reports. The updating frequency of data is quarterly, bi-annual and yearly. Since the basic data may be classified using different product classifications norms, the system implementators have provided a co-relation system which can handle three distinct product code systems (harmonized, BKN (customs code), and ITC (trade

code). Input data is also received from sixty commercial representatives of Egypt located in different countries. These representatives collect global tender inquires and key them into a PC in their office in a standard format. Through a dialup modem these inquiries and other market intelligence data are transmitted to Cairo.

The output from the database is available in the form of online by subscribers through their own terminals, and queries sent through phone/fax. The system provides information at a glance on key social and economic indicators as a 10-year time series. Users can view time series data in a visual form as graphs over time. The software is multilingual supporting English, French and Arabic interfaces. It is possible to do comparative analysis. There is a large textual database on procedures of company formation, investment projects, import-export, custom tariff, banking and a list of useful addresses of trade organizations, chambers of commerce, industry association, etc.

TradeNet also publishes a newsletter, which is circulated widely. Currently 200 companies and 30 trade associations subscribe to the database. TradeNet's service will be privatized to become an economically viable enterprise by forming a separate marketing company.

The system was developed on an IBM 9121, Model 260 main frame computer. Some of the databases also reside on a Novell PC LAN. The software has been developed using SQL, C, C++, Pascal and Clipper.

b. Debt Management Project

The difficult balance of payments situation caused Egypt to assume a rapidly increasing external debt burden. It was estimated that debt service in 1985 was over 25 percent of total export earnings. Egypt was paying one million US Dollar every six hours as interest on its debt. Therefore an efficient debt management system which could result in saving of interest payments needed to be designed.

To manage credit worthiness debt services obligation must be paid on time and new debt should be contracted on terms and in amounts, which are compatible with a nation's payment capacity. New borrowing proposals therefore needed to be analyzed in the light of existing obligations. Policy makers needed information on debt service profiles of existing debt, disbursement projections for committed but un-disbursed funds, available sources of financing and their terms, and immediate payment obligations.

The task of debt management in Egypt is divided among several organizations: the Central Bank of Egypt, the Ministry of International Co-operation, the Ministry of Finance, the Ministry of Economy and Foreign Trade and the Ministry of Defence.

In September 1986 a project to develop a debt management system was launched. The project leader was an aeronautical engineer trained in debt management modelling in Paris during his Ph.D work. The project team evaluated the existing packages available internationally. These included the UNCTAD package DMFAS and a Commonwealth Secretariat (CDRI) package, both were available in public domain. Since the software for the debt management project was financed by UNDP, the natural choice for a package was the UNCTAD package.

The package was installed in the Central Bank of Egypt, which is responsible for the registration and control of a very large loan stock. The first task was to compile the data mentioned earlier on 4,500 loans and nearly 15,000 payment schedules. The data compilation was done in a record time of one month. The data was distributed on seven 386 PCs. Then the data was aggregated using a COBOL program on a Mainframe and downloaded on PCs for further analysis. The package was used to help Egypt in the Paris Club Negotiations of May 1991 to reschedule its debt.

The software provides reports on aggregated debt, e.g., reconciliation by creditors and actual contracted debt obligation by sectors.

Extensive use of models can be made to evaluate different negotiations scenarios and their implications on repayment capacity and the overall economic reform program. The model can help negotiators in minimising future "bunching" of payments and also minimise the impact due to exchange rate fluctuations. The use of the package in the Paris Club Negotiations was considered successful. Several ministers publicly acknowledged the contribution of the debt management project in rescheduling Egypt's debt. The entire team of software developers had also travelled to Paris and provided back room support to the negotiators. The essential role of the Egyptian project team was to build up the database and to build interfaces and report generators, which could be used by Egyptian policy makers to generate additional reports (as were used by Poland in their negotiations). The original developers have designed and developed an updated version of the software running on a mainframe. The database administration on a routine basis is now being done by the Central Bank of Egypt. All transactions and modifications are being carried out on a daily basis.

c. The Legislative Database Project

One of the first projects that IDSC undertook was to create a legislative database as there existed an extremely large number of laws and decrees, sometimes in contradiction with one another, and the status of each legislation (whether amended, cancelled or still valid) was difficult to determine. The project was launched in November 1986 and was implemented over three years, involving 103 man-years. The objectives of the project were to collect all Egyptian laws and decrees starting from 1828, sort them and index them to facilitate searching with specific key words. Nearly sixty thousand laws and decrees were entered into the database, and are updated on a daily basis.

The initial data collection effort was enormous. It meant gathering all laws, presidential decrees, the Prime Minister's decrees, all ministerial

degrees, all governors' decrees, rulings of the Supreme Court, etc. Since 1958 only laws and presidential decrees have been published in the Official Gazette, on a weekly basis, and all other decrees are published daily in Al-Waqa'i. Issues of both publications were sought from all sources that catalogued them, including private collections, libraries and bookstores all over the country, to create a comprehensive database.

One of the key features of the Legislation Information System is its ability to identify both backward (proceeding legislation that was amended) and forward (consequent amendments) relations for each law and decree.

As a by-product, databases on special topics have been created such as religious rulings (affecting personal status and inheritance), rulings of the Administrative Court and Court of Cassation (to help lawyers and judges to follow earlier precedents). As a result of the effort, the Ministry of Justice is launching a comprehensive plan for legislative reform.

The software was first developed on PCs, using CLIPPER and TURBO C. Later it was transported to a mainframe using a database package, SQL interface and program modules written in COBOL, ASSEMBLER and CSP. Two software engineers work full time on developing this system. The availability of an interface card has made it possible to implement this system with a user interface in Arabic. The project is being extended to store the entire documents (not just abstracts) of laws and decrees in a scanned image form.

d. Governorates Project[16]

A 1981 presidential decree started information centers in several of the 26 governorates in Egypt. However, as the most distant governorate is 1000 kilometers from Cairo, these units did not function well. The governorate project was designed to provide decision support to key departments at the governorate level and was implemented in a phased manner with a pilot project in one governorate, followed by three other governorates, three more and finally to the remaining twenty-one governorates. The entire whole took process five years. In the future all the DSS centers will be linked via a network.

The governorates decision support centers are comprised of five departments, namely:

- Statistics Department to collect data;
- Computer Department to input the data and write local software;
- DSS Department to conduct special studies and interface between computers and decision makers;
- Library to store documents, reports, etc; and
- Publications to publish a monthly newsletter which is distributed to all governorates.

Each governorate computer center has four to six PCs (386) and 1-2 printers, staff strength varying from 15 to 50 and a director at the governorates' level who reports to the governor. Every year 3-4 weeks training is provided on database, spreadsheets and the Disk Operating System (DOS).to the staff of the governorate DSS, with several training program organized in Cairo at the IDSC headquarters.

The key sectors for which applications are being developed are education, population control, agriculture, housing, infrastructure

[16] Kamel Sherif, "The Use of Decision Support Systems in Development Planning in Egypt," Doctoral Dissertation, London School of Economics and Political Science, London, UK, July 1994.

development, tourism and industry. Some of the applications, which are popular with various governorates, are (i) local tax administration (ii) issuance of licenses, e.g., gun license, construction license and (iii) personnel management for governorates. From time to time local administration seeks assistance from the DSS Center in resolving a problem. In these cases information must be researched and analyzed and a proposal for action formulated. For example, data on student to teacher ratios was analyzed in one governorate to propose allocation of resources to schools. Proactive units identify problems and propose solutions on their own.

The project team at the IDSC headquarters consists of 22 members and is currently lead by a former army officer. There are five accounts executives who are individually responsible for 1-2 governorates. These accounts executives visit their charges once every month to provide assistance and support in software-hardware maintenance and other problem areas. There are 15 technical staff who develop program and also provide technical support to the field units. The central team has produced a booklet, which defines data that can be collected at the governorate level.

Various kinds of incentive systems have been implement to promote sharing of experiences, including a prize for best DSS applications. Four applications developed at the governorate level, which have been adopted by other governorates, have been handsomely rewarded. These applications are fully documented and are available in the form of a book and a floppy in the jacket. There is also an award for the best newsletter. The award value general ranges from 200-300% of the monthly salary.

Each governorate submits a report of its activities to the IDSC. From June 1988 to October 1992 there were 200 information requests and 466 DSS case studies. About 50 of the DSS case studies represent complete DSS.

e. Custom's reform program

The Cabinet, through one of its reform programs, planned to issue a new custom tariff, which caused stagnation in the business sector until its was finally issued. This waiting period lasted for four months where multi-sectoral conflicts arose between six different ministries. Hence, a need for a decision support system became of vital importance. It was needed for solving the conflict and supporting the issuance of needed tariffs that could help minimize the burden on low-income groups, increase the revenue of the government and achieve a homogeneous and consistent new tariff structure. Therefore, a team was formulated from the Ministry of finance and the IDSC to interact with the different parties, obtain feedback and generate various scenarios to be assessed. The impact of the project was that in a month's time the conflict was resolved and a tariff structure had been formulated based on the various scenarios and alternatives that represented the outcome of the decision support system. Consequently, the government endorsed the new tariff model and the business sector accepted it.

f. Ministry of Electricity DSS

The increasing cost and subsidies on electricity were continuously enlarging the balance of payment and adding to the burden on the economy. Thus, the IDSC developed the Ministry of Electricity DSS to assess the impact of tariff changes on different income groups, provide statistical data on power and energy generation, the distribution and consumption of electricity and to aid in pricing and managing the loans of the electricity sector. A joint team was formed from the IDSC and the Ministry for Electricity. The Ministry staff collected data from different sources while the IDSC staff focused on issue structuring, systems and human resources development and more importantly, on managing the process of developing and delivering the decision support system. During the implementation process, a strategic issue

emerged that related to drought in the sources of the river Nil. This caused a dramatic drop in the hydroelectric power generated by the Aswan dam and necessitated the provision of US$ 5,000,000 to instantly build 3 power-generating stations. Thus, the Ministry of Water Resources became an active participant in the project since it became a stakeholder in the decision support system design process. This third group from the Ministry of Water Resources, covered the issues that related water resources to electricity. The impact of the Ministry of Electricity decision support system became evident in the implementation phase. It included the incorporation of the Ministry of Water Resources as a stakeholder in energy generation related issues, the issuance of a new tariff after assessing the possible alternatives generated by the decision support model and the evaluation of their impacts on different income groups. This case showed that implementation and design processes are inseparable and evolutionary throughout all phases.

C. Key Human Resource Development Practices

The dominant impression about the staff of the IDSC that one carries away is their high degree of pride and enthusiasm for their work. They are confidence and believe that they are a part of a crusading organization. The office layout, nature of interaction among colleagues and the dress code convey an image of a relaxed and informal organization culture, an image quite contrary to the usual bureaucratic and traditional ways of a government office.

The IDSC has consciously hired staff with various backgrounds and skills. It has among its staff government administrators, computer science graduates and management graduates. The staff is also well qualified. Of the 277 employees there are 28 Ph.D.s, 54 Masters degree holders and 195 Bachelors degree holders. Interestingly the initial recruitment of staff was done in a flexible manner. It was not uncommon to recruit

close relatives and friends of staff already working with the Center provided that their qualifications were otherwise appropriate. Existing staff did the scouting for new talent members which meant that the members recruited in the initial team were quite homogeneous in their outlook and attitudes. The IDSC staff work on a contract basis and their salaries are not much higher than their counterparts in government organizations. Salaries in Egypt are low which results in a considerable brain drain of computer professionals from Egypt. In spite of low salaries, the IDSC continues to attract new talent even from the private sector. For example, 1200 professionals applied in a recent recruitment for four posts.

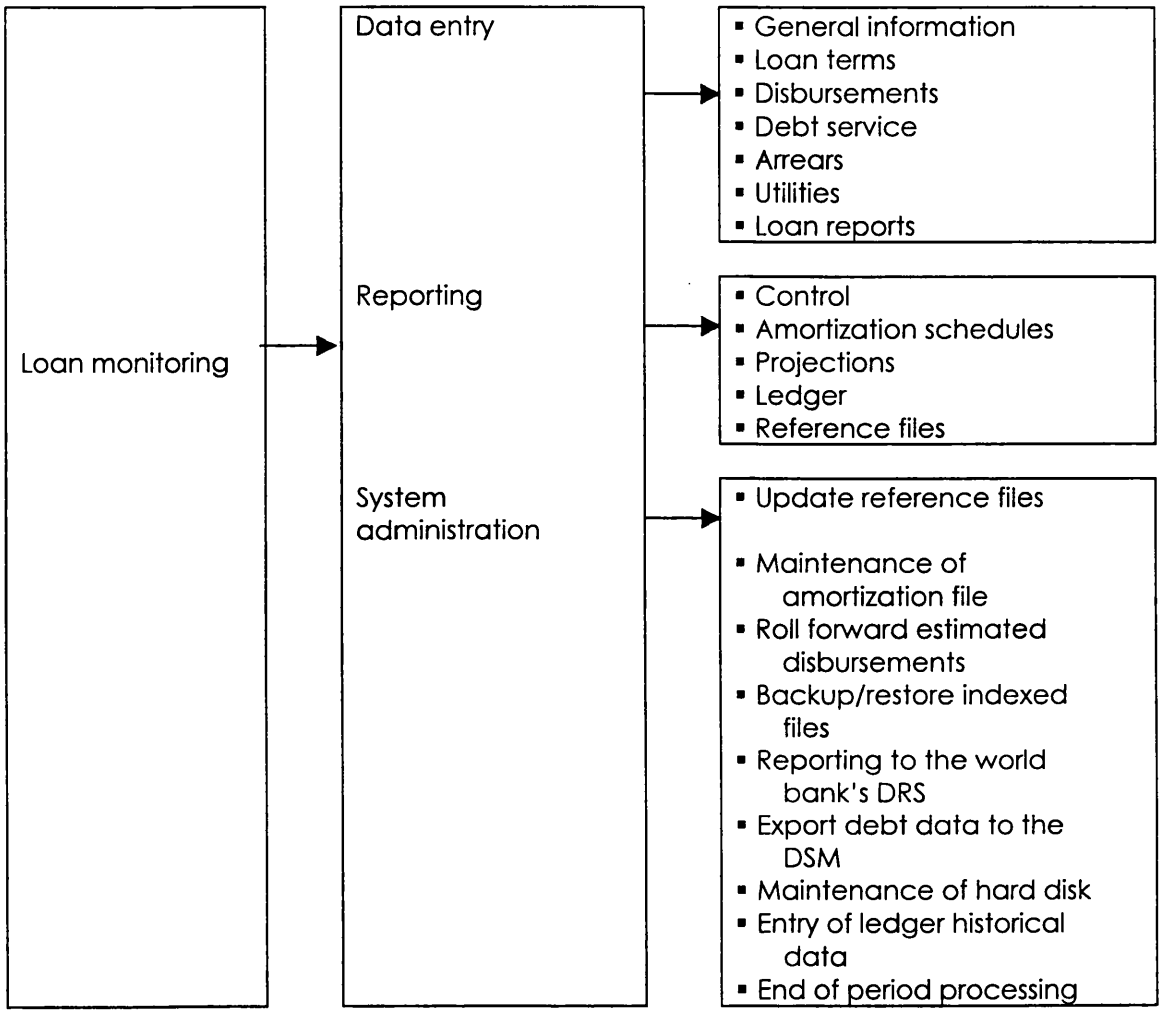
The IDSC human resource profile can be described with the usual mix of job titles typically found in IS organizations such as: system programmers, database administrators, application developers, systems analysts, end user consultants, trainers, DSS builders, network specialists, technical group leaders, and project managers. However the IDSC likes to characterize its human resources as three groups: technical, non-technical, and hybrids. Non-technical encompass interpersonal, negotiation, intervention, and "business" roles. Hybrids are individuals who have acquired a combination of technical and non-technical skills. Staff are encouraged to pursue graduate studies abroad. A total of 30 out of 150 professional staff have completed graduate studies abroad during the last five years. IDSC also encourages its staff to teach in the local universities and invites the local university staff to participate in IDSC activities. In addition to its permanent staff, the IDSC, particularly in early phases of evolution, used sizable numbers of experts from outside as part-timers, subcontractors, and consultants. To foster strong links between the individual and the IDSC, a weekly staff meeting, to include part time staff, is held to share experiences and problems. A monthly newsletter is also published for the same purpose.

Appendix V-A

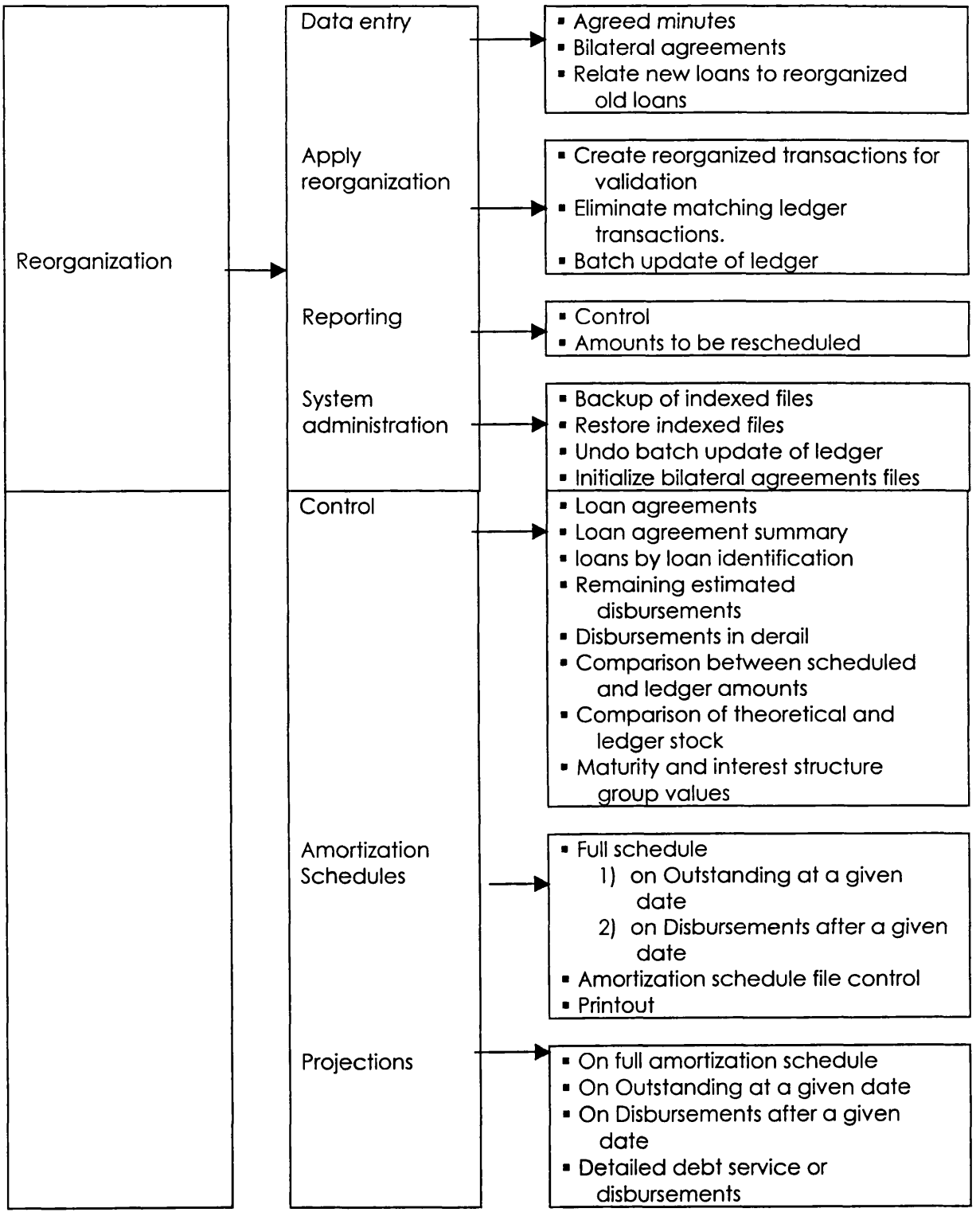
Debt Management and Financial Analysis System (DMFAS)

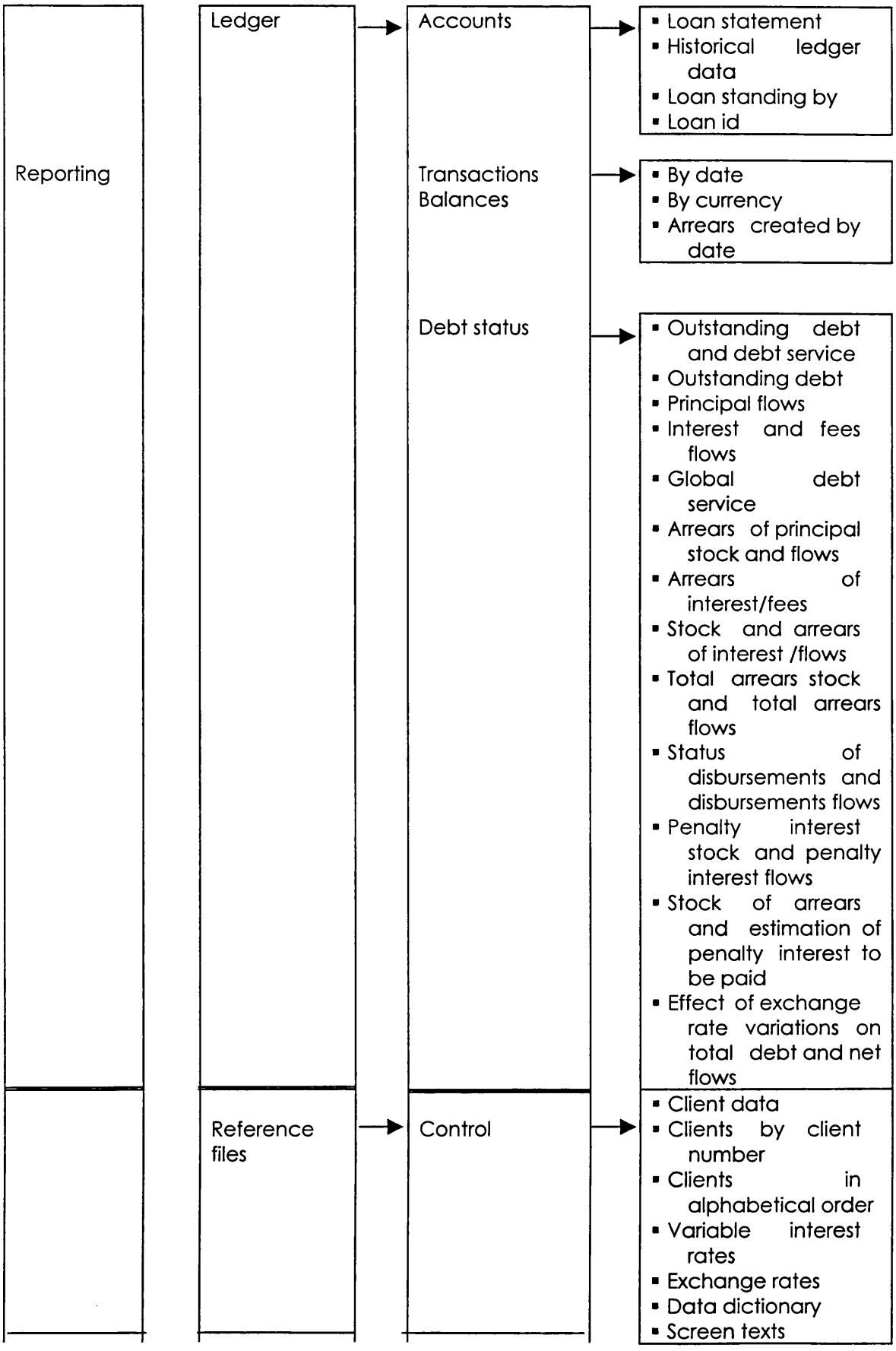
A. System Principle Functions

DMS



DRES


Reorganization
Data entry
Apply reorganization
Reporting
System administration
Control
Amortization Schedules
Projections
▪ Agreed minutes
▪ Bilateral agreements
▪ Relate new loans to reorganized old loans
▪ Create reorganized transactions for validation
▪ Eliminate matching ledger transactions.
▪ Batch update of ledger
▪ Control
▪ Amounts to be rescheduled
▪ Backup of indexed files
▪ Restore indexed files
▪ Undo batch update of ledger
▪ Initialize bilateral agreements files
▪ Loan agreements
▪ Loan agreement summary
▪ loans by loan identification
▪ Remaining estimated disbursements
▪ Disbursements in derail
▪ Comparison between scheduled and ledger amounts
▪ Comparison of theoretical and ledger stock
▪ Maturity and interest structure group values
▪ Full schedule
1) on Outstanding at a given date
2) on Disbursements after a given date
▪ Amortization schedule file control
▪ Printout
▪ On full amortization schedule
▪ On Outstanding at a given date
▪ On Disbursements after a given date
▪ Detailed debt service or disbursements


Reporting
Ledger
Accounts
Loan statement
Historical ledger data
Loan standing by
Loan id
Transactions Balances
By date
By currency
Arrears created by date
Debt status
Outstanding debt and debt service
Outstanding debt
Principal flows
Interest and fees flows
Global debt service
Arrears of principal stock and flows
Arrears of interest/fees
Stock and arrears of interest /flows
Total arrears stock and total arrears flows
Status of disbursements and disbursements flows
Penalty interest stock and penalty interest flows
Stock of arrears and estimation of penalty interest to be paid
Effect of exchange rate variations on total debt and net flows
Reference files
Control
Client data
Clients by client number
Clients in alphabetical order
Variable interest rates
Exchange rates
Data dictionary
Screen texts

B. DMFAS Reports

Menu Option	*Code*	*Report Description*
LOAN MONITORING		
Data Entry		
Loan reports		
	E1	Registration
certificate		
	E2	Schedule as entered
	E3	Loan/client relations
	E4	Loan by loan ID
	E5	Loan statement
	E6	Historical ledger data
	E7	Loan standing
Reporting		
Control		
	C1	Loan agreements
	C2	Loan agreement Summary
	C3	Loan by loan identification
	C4	Remaining estimated disbursements
	C5	Disbursements in detail
	C6	Comparison between scheduled and ledger amounts
	C7	Comparison of Theoretical and ledger stock
	C8	Maturity and interest structure group values
Amortization Schedules		
	A1	Full schedule
	A2	on Outstanding at a given date
	A3	on Disbursements After a given date
	A4	Amortization schedule file control printout

Projections

P1	on Full amortization schedule
P2	on Outstanding at a given date
P3	on Disbursements after a given date
P4	Detailed debt service or disbursements

Ledger

Loan accounts

LA1	Loan statement
LA2	Historical ledger data
LA3	Loan standing by loan ID.

Ledger Transactions

LT1	by Date
LT2	by Currency
LT3	Arrears created by date

Debt Status

LS1	Outstanding debt and global debt service
LS2	Outstanding debt
LS3	Principal flows
LS4	Interest and fees flows
LS5	Global debt service
LS6	Arrears of principal stock and flows
LS7	Arrears of interest/fees stock and arrears of interest/fees flows
LS8	Total arrears stock And total arrears flows
LS9	Status of disbursements and disbursements flows
LS10	Penalty interest stock and penalty interest flows
LS11	Stock of arrears and estimation of penalty interest to be paid

LS12	Effect of exchange rate variations on total debt and net flows

Reference Control

R1	Client data
R2	Client by client number
R3	Print variable Interest Rate
R4	Exchange rate
R5	Print data dictionary
R6	Print screen texts
R7	Client in alphabetical order

System Administration

Reporting to the world Bank DRS

W1	Description of individual external public debts & private debts publicly guaranteed
W2	Individual external public debts & Private debts publicly guaranteed.

C. System Maintenance and Support

All DMFAS source programs are handed over to the users of the system. UNCTAD will continue to bear responsibility for the maintenance of the DMFAS. Due to the open architecture of the system, users are free to add their own routines to the system, e.g., in the form of additional report preparation programs and / or scenario generation routines. However, from the point of view of maintenance, UNCTAD does not advice programming staff of a given country to modify existing programs.

UNCTAD has a well-established group who are continually improving the DMFAS and training staff in its use. When enhanced versions of the system are prepared, the new program is prepared in the appropriate machine-readable form for each user with instructions for its installation.

D. System Hardware Requirements

The DMFAS is transportable to many different hardware environments. Examples of four possible configurations are as follows: (i) one microcomputer with 256 KB memory (but preferably 640 KB) a disk drive, a 10-20 MG hard disk and a printer; (ii) two or more microcomputers, each with two diskette drives linked together under a local area network, sharing a 20 MB hard disk and a printer; (iii) one special purpose, personal computer with one diskette and a hard disk, serving both as a mainframe terminal and as a personal microcomputer; and (iv) a mainframe computer with a time-sharing option.

Appendix VI-A

Debt Management Decision Support Examples

Egyptian debt indicators adjustment process[17]:

As discussed in Chapter II, debt comparative analysis for a country is usually performed through measuring of several debt indictors. There are four major indictors that classify countries into high / low indebted in relation to high / low income[18].

These four indicators and their critical values are as follows:

Indicator	Critical Value (%)	Egypt 1991 (%)
▪ Total External Debt/ Export of Goods & Services [EDT / XGS]	165	280
▪ Total External Debt / GNP [EDT / GNP]	30	130
▪ Total Debt Service / Export of Goods & Services [TDS / XGS]	18	16
▪ Total Interest Payments / Export of Goods & Services [INT/ XGS]	12	6

Before the second Paris Club negotiation round, the GOE intensified its effort to improve Egypt's debt situation, and to this end; examined the requirements necessary for Egypt to shift its position (from a severely indebted low-income country (SILIC) to a moderately indebted low-income country - MILIC). To reach this objective, the (DM&EM) team began manipulating the figures to determine the amount of change needed in Egypt's total external debt, exports of goods and services and it's GNP to attain this goal.

---

[17] In part from some exercise of the DM&EM program 1995

[18]. Debtor countries classification :-

1.Severely indebted low-income countries. (SILIC);
2. Severely indebted middle-income countries. (SIMIC);
3. Moderately indebted low-income countries. (MILIC); and
4. Moderately indebted middle-income countries. (MIMIC)

This study was supplemented with several explanatory charts of the four key ratios (indicators) in order to assist top polices makers to view the different scenarios graphically. An additional, the objective of this chart was to show where Egypt stood with regard to other indebted countries. Examples of some cases are as follows:

Case # 1:

Assumption A :

According to the previous table Egypt's EDT/XGS is 280% while the critical value set by the World Bank is 165% . Assuming that Egypt's EDT should remain constant, what is the minimum value that Egypt's. XGS could reach in order to achieve the World Bank's critical value for the EDT / XGS ratio. To put it in other words, how much of an increase should take place in Egypt's XGS to reach this objective?

It is given that the EDT of Egypt = U$ 40,600 million and XGS = U$ 14,500 million. After a series of calculations, it was found that Egypt's XGS should increase from U$ 14,500 million to U$ 24,606 million, if it was to reach an EDT / XGS ratio of 165%.

Assumption B :

Assuming that Egypt's XGS remains constant, what is the maximum amount Egypt's EDT should not exceed. In other words, what is the amount of decrease in EDT required to reach an EDT / XGS ratio of 165%.

After implementing the same steps adopted in the previous assumption, it was decided that Egypt's EDT should decrease from U$ 40,600 Million to U$ 23,925 Million. But attaining an EDT / XGS ratio of 165% or lower was not sufficient to entitle Egypt to be included in the Moderately Indebted Low-Income Countries, which was the original target. Egypt needed also to attain an EDT / GNP ratio of 30% instead of the 130% it actually had.

Case # 2

Assumption A :

According to data given, Egypt's GNP = U$ 31,200 million, its EDT = U$ 40,600 million and it's EDT / GNP 130%. Assuming that Egypt's GNP remains constant, what was minimum value that Egypt's EDT could reach in order to achieve the World Bank's critical value of 30%.

The result of our calculations was that Egypt's EDT should decrease form U$ 9,360 million if we were to reach the 30% target.

Assumption B :

Assuming that Egypt's EDT remains constant, what is the minimum value allowed Egypt's GNP or how much increase in Egypt's GNP should take place in order to achieve the 30% target.

The result reached after the calculations was that Egypt's GNP needed to grow from its current GNP of U$ 31,200 million to targeted U$ 135,333 million, which is economically impossible.

Appendix VI-B

Egyptian Debt Management Unit Focus

DMU's in general may employ the following debt management fuctions:

I. Executive Debt Management	**Direction and Organizations**
• Policy Function	Strategy
• Regulatory Function	Structure
• Resourcing Function	Staffing and Means

II. Operational Debt Management	**Debt Dynamics and Practice**
Passive Management	
• Recording Function	Information
• Analytical Function	Analysis
Active Management	
• Operating Function	Operations
• Controlling Functions	Control
	Coordinating
	Monitoring

(See appendix III-B for an explanation of each of the above functions)

The management of the Egyptian Debt Management Unit successfully to focused on the executive level of Debt Management (that is, it was mainly concerned with leveraging and supporting the decision making process of top policy and decision makers constituting the Egyptian High Level Economic Committee which has driven the economy of Egypt in general and its debt management in particular since 1986).

The executive level of the Egyptian debt management program was constructed as an establishment dictating the "rules of the game" by the highest levels of government. It thus gives direction and organization to the whole debt management constitution.

Graphically, the Egyptian debt management components, functions and work processes could be viewed as follows:

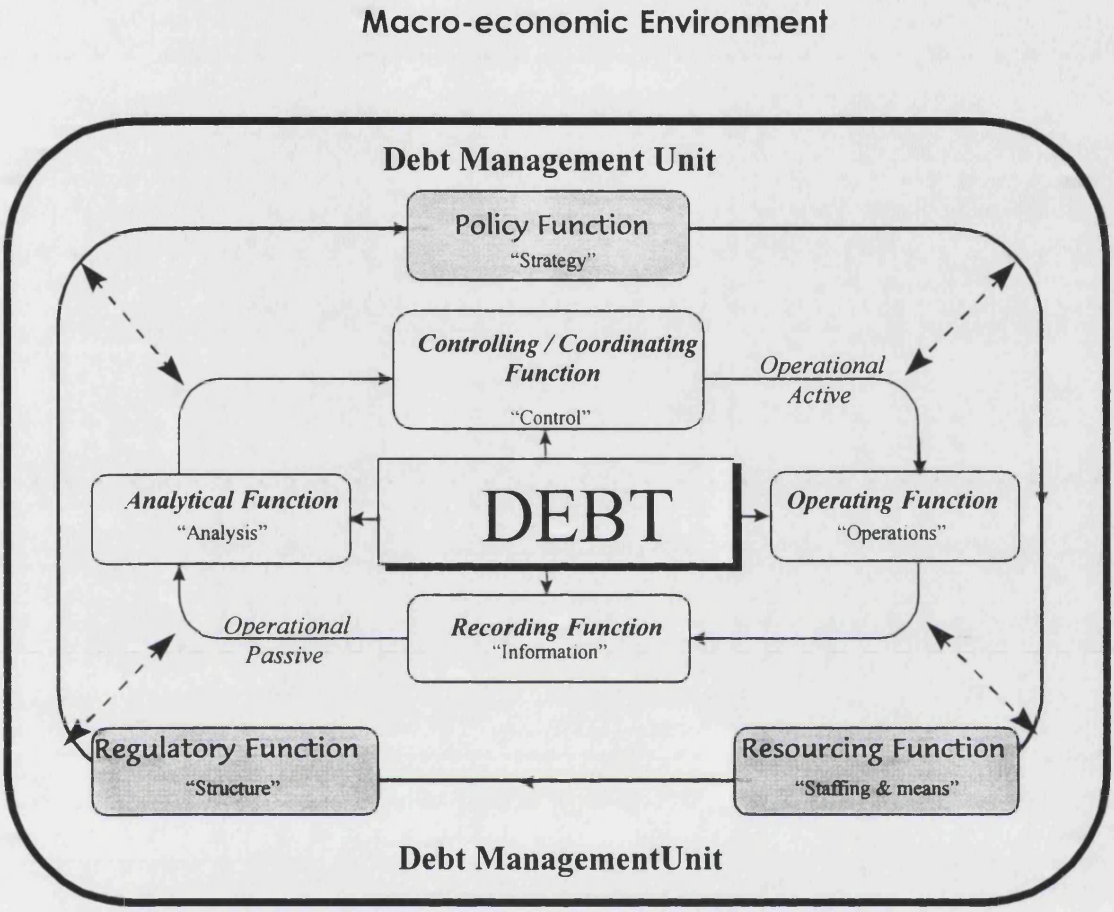


Figure VI-B-I

Egyptian Debt Management Components, Functions & Work Process

Figure VI-B-1 should be interpreted as representing the DMU functions and their products as building blocks for an effective debt management system. The lines link the functions or blocks at two levels: the executive and the operational level.

At the executive management level, the policy, regulatory, and resourcing functions give direction and organization to the entire debt management system. Macro-economic environment and the analytical, and human environment are both affecting and being

affected by these functions. The evolving strategy, structure, staffing, and means determine the way debt management should be performed at the operational level.

Bibliography

- Abbas, Ayman M., Problems of Foreign Debt Management in Egypt, Cairo: s.n., 1988.
- Agell, Jonas, Persson, Mats and Friedman, Benjamin M, Does debt management matter, Oxford: Clarendon Press, 1992.
- Aizenman, Joshua and Borensztein, eduardo R., Debt and conditionality under endogenous terms of trade adjustment, Washington, D.C.: International Monetary Fund, 1988.
- Al-Ameen, A., The external debt problem of the Thrid World countires, Safat: Industrial Bank of Kuwait, 1988.
- Alavi, M. and Henderson,J., "Evolutionary strategy for implementing a decision system, Management Science, 27, 11, November 1981.
- Alavi, M., "An assessment of the prototyping approach to IS develoment", Communications of the ACM, 27, June1984, pp556-563.
- Alter, Steven., Decision support systems: current practice and continuing challenges, Readings, Mass: Addison-Wesley, 1980.
- Alter, Steven., Information Systems: a management perspective, Menlo Park Calif.: Benjamin/Cummings pub. Co., 1996.
- Ariav, G., "DSS design: a systemic view of decision support", Communications of the ACM, 28, October 1985.
- Arinze, Orakwue Bay, Decision Support Systems: a framework for supporting decision-making processes based on a model of the DSS-USER interface, London: The London School of Economics and Political Science, Ph.D. thesis, 1987.
- Askari, Hossein, Thrid world debt and financial innovation: the experiences of Chile and Mexico, OECD, 1991.
- Attewell, P., and Rule, J., "Computing and organizations: what we know and what we don't know", Communications of the ACM, 27,

December 1984.

- Aubanel, Gerard, External Debt Accounting Issues, Debt Management Systems, pp 146-158.
- Avgerou, Chrisanthi, Computer-based information systems and modernization of public administration in developing countries, London : Department of Information Systems, The London School of Economics and Political Science, 1989.
- Avgerou, Chrisanthi, Teaching information technology for developing countries at the London School of Economics and Political Science, London: Department of Information Systems, The London School of Economics and Political Science, 1989.
- Avison, D.E. and Fitzgerald, G. Information systems development: methodologies, techniques and tools, Oxford: Blackwell Scientific Publications, 1988.
- Baarck, R., The context of national information systems in developing countries, Lund: Research Policy Institute, University of lund, 1986.
- Baark, Erik, The context of national information systems in developing countries: India and China in a comparative perspective, Lund: Research Policy Institute, University of Lund, 1986.
- Backhouse, James, Liebenau, Jonathan and Land, Frank L., "On the discipline of information systems", Journal of Information Systems, 1991, 1,1, pp 19-27.
- Balassa, Bela and Herber, Bernard P. (eds.), The Problem of the Debt in Developing Countries, Public finance and public debt: Proceedings of the 40th Congress of the International Institute of Public Finace, Innsbruck, 1984, 1986 pp 153-66.
- Banville, Claude, "Legitimacy and cognitive mapping: a study of the social dimension of information systems" in Hans-Erik Nissen (ed.), The Information Systems Research Arena of the 90's, Challenges, Perceptions and Alternative approaches, 1991.

- Basu, Kaushik, The international debt problem, credit rationing and loan purchsing: theory and experience, Princeton: International Finance Section, Department of economics, Princeton University, 1991.
- Basu, Kaushik, The international debt problem: Could someone please explain it to me?, Helsinki : Wider, 1989.
- Benbasat, I. And Nault, B.R., "An evaluation of empirical research in managerial support systems", Decision Support System, 6, 1990.
- Benbasat, I., "An analysis of research methodologies" in F.William McFarlan (ed.) The information systems research challenge (Proceedings of the Harvard Business School Research Colloquium), Boston: Harvard Business School Press,1985.
- Benbasat, I., Dexter A.S., Drury, D.H., and Goldstein, R.C., " A critique of the stage model: theory and empirical evidence", Communications of the ACM, 27 May 1984.
- Benbasat, I., Goldstein, D.K., and Mead, M., "The case research strategy in studies of IS", MIS Quarterly, 11, September 1987.
- Bennett, J., "Integrating users and decision support systems", in J.D. White (eds.), Proceedings of the sixth and seventh annual conferences of the society for Management Information Systems, Ann Arbor: University of Michigan, July 1975.
- Bergeron, F., Bteau, C., and Raymond, L., "Identification of strategic information systems opportunities: applying and comparing two methodologies", MIS Quarterly, 15, March1991.
- Bhatnaga, Subhash C. and Bjorn-Anderson, Niels (eds.), Information technology in developing countries: Proceedings of the IFIP TC9/TC8 working conference on the impact of information systems on developing countries, Amsterdam: North Holland, 1990.
- Bird, Graham (ed.), Third World debt: the search for a solution, Aldershot: Elgar , 1989.

- Blake, David and Pradhan, Mahmood, Debt-equity swaps as bond conversions: implications for pricing, London: Birkbeck College, 1990.
- Bloor, Ian, Performance indicators and decision support systems for libraries: a practical application of 'Keys to Success', London: British Library Research and Development Department, 1991.
- Boaden, R.J. and Lockett, A. Geoffrey, "Information technology, information systems and information management: definition and development", European Journal of Information Systems, 1991, 1,1, pp 23-32.
- Bodin, Alain, Cosio-Pascal, Enrique and Straatman, Philippe, Effective Debt Management, pp 48-58.
- Boland, Richard and Hirschhein, Rudy (eds.), Critical Issues in Information Systems Research, Chichester: Wiley , 1987.
- Boland, Richard J., "Information system use as a hermeneutic process" in Hans-Erik Nissen (ed.), The Information Systems Research Arena of the 90's, Challenges, Perceptions and Alternative Approaches, 1991.
- Bonczek, R.H.,Hosapple, C.W., and Whinston, A.B., "Foundations of Decision Support Systems", Academic Press, New York,1981.
- Bonoma, T.V., "Case Research in Marketing: Opportunities, Problems and a Process", Journal of Marketing Research, (22:2), May 1985.
- Boothe, Paul and Bradford, Reid, Debt Management Objectives for a Small Open Economy, Journal of Money, Credit, and Banking, February 1992, 24(1), pp 43-60.
- Borensztein, Eduardo, Will Debt Reduction Increase Investment?, Finance and Development, March 1991, 28(1), pp 25-27.
- Buckingham, Richard, Frank Land, Rudy Hirschheim, and Tully, Colin (eds.), Information Systems Education: Recommendations and Implementation, Cambridge: Cambridge Univesity Press, 1987.
- Butkiewicz, James L., The Impact of Debt Finance on Aggregate

Demand, Journal of Macroeconomics, Winter 1989, 3(1), pp 77-90.

- Calvo, Guillermo (ed.) , Debt, stabilization and development: essays in memory of Carlos Diaz-Alejandro, Oxford: Basil Blackwell, 1988.
- Caprio, Gerard, Policy uncertainty, information asymmetries, and financial intermediation, Washington D.C.: Country Economics Department, The World Bank, 1992.
- Carvounis, Chris C., The debt dilemma of developing nations: issues and cases, Westport, Conn.: Quorum Books, 1984.
- Casimir, Rommet J., "Characteristics and implementation of decision support systems", Information &Management, 14, 1988.
- Cavaco, Silva, Anibal, A. and Herber, Bernard P (eds.), Macroeconomic Impact of Debt Financed Fiscal Deficits: Non-scepticalConsierations, Public finance and public debt: Proceeding of the 40th Congress of the International Institute of Public Finance, Innsbruck, 1984, 1986 pp 69-80.
- Central Agency for Public Mobilization & Statistics (CAPMAS), Yearly Statistical Report, Egypt 1988.
- Central Agency for Public Mobilization & Statistics (CAPMAS), Yearly Statistical Report, Egypt 1992.
- Central Agency for Public Mobilization & Statistics (CAPMAS), Yearly Statistical Report, Egypt 1997.
- Chelliah, Raja J., The growth of Indian debt: dimensions of the problem and corrective measures, Washington D.C.: International Monetary Fund, 1991.
- Ciborra, Claudio, "Research agenda for a transaction cost approach to information systems" in Richard Boland and Rudy Hirshheim (eds.), Critical Issues in Information Systems Research, 1987 pp 253-274.
- Claessens, Stijn, et al, Market-Based debt reduction for developing countries: Principles and prospects, Policy and Research Series, 1990,

no. 16, pp v, 62.

- Clapper, Daniel L. and McLean, Ephriam R., "Information technology in support of group activity: a theoretical framework and implications for research" in Hans-Erik Nissen (ed.), The Information Systems Research Arena of the 90s, Challenges, Perceptions and Alternative Approaches, 1991.
- Cohen, Benjamin J., Developing country debt: a middle way, Priceton, N.J.: Princeton University, 1989.
- Cohen, Daniel and Verdier, Thierry, Debt, debt relief, and growth: a bargaining approach, Washington, D.C.: International Economics Department, The World Bank, 1991.
- Cohen, Daniel,. The Management of the Developing Countries' Debt: Guidelines and Applications to Brazil, World Bank Economic Review, January 1988 pp 77-103.
- Coleman, Kevin G., Reengineering MIS: Aligning Information Technology and Business Operations, Harrisburg, pa., USA: Idea Group Pub., 1996.
- Conyers ,D and Hills, P., "An introduction to development planning in the third world", Chichester: John Wiley & Sons,1984.
- Cooper, R.B., and Zmud, R.W., "Information technology implementation research: a technological diffusion approach", Management Science, 36, February 1990.
- Cooper, Richard N. , Economic stabilization and debt in developing countries, Cambridge, Mass: MIT Press, 1992.
- Dansker, B. , Hansen, J. S. and Loftin, R., Issue Management in the Information Planning Process, MIS Quarterly, June 1987, 11(2), pp 223-232.
- David, I.P. and Lee, Jungsoo, External debt situation in Asia developing countries, Manila, Philippines: Asian Developing Bank, Economics office, 1986.

- Davis, G.B., and Olson, M.B., MIS: Conceptual foundations, structure and development, New York: McGraw-Hill, 2nd edition, 1985.
- De Looff, L.A., Information Systems Outsourcing Decision Making: A Managerial Approach, Harrisburg, Penn: Idea Group Publ., 1997.
- Debt Analysis and Management Systems "DAMS", S.G. Warburg and Co. Ltd., London, January 1987.
- Debt Management and Developing Countries, UNDP, July 1989.
- Debt Management and Economic Monitoring (DM&EM) Program brochure, IDSC, Cairo, 1991.
- Debt Management and Economic Monitoring (DM&EM) Program document, IDSC, Cairo, 1987.
- Debt Management and Financial Analysis System – A guide to managers, IDSC – Debt Management Unit (DMU), Cairo, 1993.
- Dehesa, Guillermo De La, Institutional Structure for External Debt Management, Debt Management Systems, pp 88-98.
- Delamaide, Darrel , Debt shock, London: Weidenfeld and Nicolson , 1984.
- Diwan, Ishac and Spiegel, Mark M., Are buy-back back?: menu-driven debt-reduction scheme with heterogeneous creditors, Washington, D.C. : International Economics Department, The World Bank, 1991.
- DMFAS - Information Note, UNCTAD Secretariat, UNCTAD - Geneva, February 1993 (restricted distribution).
- Doll, William J. "Avenues for Top Management Involvement in Successful MIS Development." MIS Quarterly (March 1985).
- Donovan, J.J., and S. E. Madnick. "Institutional and Ad Hoc Decision Support Systems." Data Base, Vol. 8, (Winter 1977).
- Dornbusch, Rudiger, Makin, John H. and Zlowe, David (eds.), Alternative solutions to developing-country debt problems, American Enterprise Institute, 1990.

- Dowsett, Hugh, The Use of Computers in Debt Management, June 1986.
- Dreze, Jacques H., A proposal for "Cooperative Relief of Debt in Africa" (CORDA), Helsinki: World Institute for Development Economics Research, 1989.
- Duchon, D. and Kaplan, B., "Combining qualitative and quantitative methods in information systems research: a case study", MIS Quarterly, December1988.
- Dutton, W. and Kraemer, K., Modelling as Negotiating: The Political Dynamics of Computer Models in the Policy Process, 1985.
- Earl, M.J., Information systems strategy formulation, Critical issues in information systems research, Boland and Hirschheim (eds), New York: John&Wiley and Sons,1987.
- El Sawy, O. and El Sherif, H., Partnership Workshop on Providing Information and Decision Support Services for Top Level Decision Makers, 1987.
- El Sawy, O.A.,"Personal information systems for strategic scanning in Turbulent environments: Can the CEO go on-line?", MIS Quarterly (9:1), March 1985.
- El Sherif, H., "A frame work for the development of the public sector information in Egypt paper presented to the international ICPE-EDI seminar on public sector performance in developing countries, Ljubljana (Yugoslavia), November 16-25,1987.
- El Sherif, H., "Managing institutionalization of strategic decision support for the Egyptian cabinet", Interface, 20,1, January-February 1990.
- El Sherif, H., An accelerated development strategy for developing countries: An informatics and decision support system approach, Ph.D. Thesis, 1982.
- El Sherif, H., and El Sawy, O., "Issues-based decision support systems

for the Cabinet of Egypt", MIS Quarterly, 12(4), December 1988, pp 551-69.

- El Sherif, H., and Gray, P.,"From crisis management to fast response DSS: an international perspective", to appear in DSS '91 transactions June 1990.
- El Sherif, H., Building a Crisis Management Strategic Support System, Advances in Telecommunication Management, 1990, 3, pp 35-52.
- El Sherif, H., Managing Large Information and Decision Support Systems Projects, IFORS Conference Proceedings, 1988.
- El Sherif, H., on the event of the dissemination of the World Bank new edition of the World Debt Tables during which Cairo was chosen, for the first time, to be a recipient and not a donor country, Cairo, May 18-20, 1996.
- El Sherif, H., The Cabinet Information and Decision Support Systems Project, Ministry of Cabinet Affairs, 1985.
- Elam, J.J, Huber ,G.P, and Hurt, M.E., "An examination of the DSS literature (1975-1985)", Decision Support Systems: A decade in Perspective, E.R. McLean and H.G. Sol (eds.), Elsevier Science Publishers B.V. (North Holland) IFIP,1986.
- Elliot, Geoffrey., Business Information Technology Systems, Theory and Practice, Longman, 1998.
- Erickson, Michael Glenn, Debt management as a stabilization tool: An evaluation, Ph.D. Thesis, 1987.
- Eskridge, William N. (ed.), A Dance along the precipice: the political and economic dimension of the international debt problem, Lexington, Mass.: Lexington Books, 1985.
- Evans, Clifford W., Commercial Bank Debt Rescheduling, Debt Management Systems, pp 137-145.
- Feinberg, Richard E. and Kallab, Valeriana (eds.), Adjustment crisis in the Third World, New Brunswick,USA: Transaction Books, 1984.

- Feller,I., "Managerial response to technological innovation in public sector organizations", Management Science, 26,10, October 1980.
- Fick, Goran and Sprague Jr., Ralph H. (eds.), Decision support systems: issues and challenges - proceedings of an international task force meeting June 23 - 25, 1980, Oxford: Pergamon, 1980.
- Finlay, Paul N., Introducing Decision Support Systems, Oxford, UK: Ncc Blackwell; Cambridge, Mass., USA: Blackwell Publishers, 1994.
- Follak, Klaus Peter, The impact of banking regulations on development aid and external debt management, Bank Archiv Zeitschrift feur das gesamte Bank und Beorsenwesen, no.3 1992, 40, pp 200-26.
- Ford, J.D., The Management of Organizational Crisis, Business Horizons, 1981, 24(3), pp 10-16.
- Franz, Charles R. and Robey, Daniel, "Strategies for research on information systems in organizations. A critical analysis of research purpose and time frame" in Richard Boland and Rudy Hirschheim (eds.), Critical Issues in Information Systems Research, 1987 pp 205-225.
- Frenkel, Jacob A., Dooley, Michael P. and Wickham, Peter (eds), Analytical issues in debt, Washington,D.C.: International Monetary Fund , 1989.
- Gemmell, Norman, Debt and the Developing Countries: A Simple Model of Optimal Borrowing, The Journal of Development Studies, January 1988, 24 (2), pp 197-213.
- George, Susan, A fate worse than debt: a radical new analysis of the thrid World debt crisis, London: Penguin, 1988.
- Ghai, Dharam (ed.), The IMF and the South: the social impact of crisis and adjustment, London: Zed location Books, 1991.
- Giersch, Herbert (ed.), The International debt problem: lessons for the future, Tubingen: J.C.B. Mohr (P.Siebeck), 1986.

- Goodman, S.E., "Computing in a less developed country", Communication of the ACM, Vol 34. No. 12, December 1991.
- Goodman, S.E., and Green, J.D., "Computing in the Middle East", Communications of the ACM, Vol 35. No. 8, August 1992.
- Gorry, G.A., and Scott Morton, M.S., "A framework for management information systems" Sloan Management Review, Vol. 13, No. 1, fall 1971.
- Government, of Egypt and UNDP, External Debt Decision Support Systems project document, 1986.
- Gray, P., Group Decision Support Systems, Decision Support Systems, September 1987, 3(3), pp 233-242.
- Gray, Paul., Decision Support and Executive Information Systems, Englewood Cliffs, N.J. : Prentice-Hall, 1994.
- Gray,P., "Using technology for strategic group decision making" Working paper, Claremont Graduate School, Claremont, CA, January 1988.
- Greene, Joshua, The external debt problem of the sub-Saharan Africa, Washington, D.C.: International Monetary Fund, 1989.
- Greene, Joshua, The sub-Saharan African debt problem: an update, Washington, D.C. : International Monetary Fund, 1992.
- Griffith Jones, Stephany (ed.), Managing World Debt, Harvester Wheatsheaf St Martim's, 1988.
- Griling, Robert Henriques, Multinational institutions and the Thrid World: management, debt, and trade conflicts in the international economic order, New York: Praeger, 1985.
- Gunawardane, G., "Implementing an MIS in an extremely dynamic environment-a case study", Interfaces, 15,November –December 1985.
- Gutowski, Armin , Holthus, Manfred and Kebschull, Dietrich (eds.), Indebtedness and growth in developing countries, Hamburg :

Verlag Weltarchiv , 1986.

- Gutowski, Armin and Holthus, Manfred, Limits to international indebtedness, New Brunswick, [N.J.], U.S.A: Transaction Book, 1988.
- Hassan, Ashraf "Central Bank of Egypt Work Flow and Procedures – case study", Cairo, Egypt, July 1994.
- Hawgood, John and Humphreys, Patrick (eds.), Effective decision support systems, Aldershot, Hants, England: Technical Press in association with Unicom Seminars, 1988.
- Henderson, J., Rockart, J. and Sifonis, J., Integrating Management Support Systems into Strategic Information Systems Planning, Journal of MIS, Summer 1987, 4(1), pp 5-24.
- Henderson, John C., and David A. Schilling, " Design and Implementation of Decision Support Systems in the Public Sector." MIS Quarterly (June 1985).
- Hershey, Rachel Riemann, An effective spatial decision support system for land use planning: with an example from forest management, London: The London School of Economics and Political Science, M.Phil. Thesis, 1992.
- Heymann, H. G. and Bloom, Robert Bloom, Decision support systems in finance and accounting, London: Department of Information Systems, The London School of Economics and Political Science, 1989.
- Heyzer, Noeleen (ed.), Impact of debt management and economic restructuring on women, Kuala Lumpur: Asian and Pacific Development Center, 1990.
- Hicks, Norman L., Expenditure Reductions in High-Debt Countries, Finance and Development, March 1989, 26(1), pp 35-37.
- Hirschheim, R.A., and Klein H.K., "Four paradigms of information systems development", Communications of the ACM, 32, October 1989.

- Hirschheim, R.A., and Klein H.K., "Fundamental Issues of decision support systems: A conquestialist perspective", Decision Support Systems, 1,1985.
- Hirschheim, R.A.,"Information systems epistemology: a historical perspective" in research methods in information systems, Amsterdam: North Holland, 1985.
- Hodge, B.J., Organizational theory, Boston: Allyn and Bacon, 2nd ed, 1984.
- Hogue, Jack T. "Decision support systems and the traditional computer information system function: An examination of relationships during DSS application development," Journal of management information systems, summer 1985, p. 35.
- Holley, H. A. , Developing country debt: the role of the commercial banks, London: Routledge and Kegan Paul [For] the Royal Institute of International Affairs, 1987.
- Hope, Nicholas and Klein, Thomas, Issues in external debt management: effective management is crucial to avoiding debt servicing crises, Finance and Development: a quarterly publication of the International Monetary Fund and the World Bank, Sept. 1983, 20, pp 23-5.
- Housel, T.J. , El Sawy, O.A. and Donovan, P.F., Information Systems for Crisis Management: Lessons from Southern California Edison, MIS Quarterly, December 1986.
- Huber, G.," Organizational IS deteminants of their performance and behaviour", Management Science, 28, February 1982.
- Hunsberger, David, Working with Consultants in Debt Management Area, 29 February p. 67.
- Husain, Ishrat and Diwan Ishac (eds.), Dealing with the debt crisis, A World Bank Symposium, 1989, pp xiv, 308.
- Husain, Ishrat, Organising for Efficient Debt Management, Debt

Management Systems, pp 9-13.

- IBRD, IMF, BIS and OECD, External Debt (Definition, Statistical Coverage and Methodologies), Paris, 1988, p.19
- Ives, B. and Javenpaa, S.L., "Applications of global information technology: Key issues for management", MIS Quarterly, 15, March 1991.
- Ives, B. and Olson, M.H., "User Involvement and MIS success: a review of research", Management Science, 30,5, 1984.
- Jack T. Hogue, "Decision Support Systems and the Traditional Computer Information System Function: An Examination of Relationships during DSS Application Development." Journal of Management Information Systems, Summer 1985, p. 35.
- Jago, A.G. and Scamell, R.W., "Decision-making styles of the MIS manager: a comparative evaluation" Information & Management, 5, 1985.
- Jasic, Zoran, Singer, Hans W. and Sharma, Soumitra (eds.), Management of the thrid-world debt, growth and external debt management, 1989 pp 30-45.
- Kalderen, Lars, Debt Management in Sub-Saharan Africa - The Need for Technical Assistance and How to Meet it, 1988.
- Kamel, S., "Decision Support in the governorates level in Egypt", Proceedings of the 4th International Conference of the Information Resources Management Association, Salt Lake City, Utah, USA, May 22-26. 1993.
- Kamel, Sherif, Ph.D. Thesis: The use of decision support systems in development planning in Egypt, LSE, London, Uk, 1994.
- Kaplan N., Duchon, D., "Combining qualitative and quantitative methods in IS research: a case study:", MIS Quarterly, 12, December 1988.
- Kaushik, S.K. (ed.), The debt crisis and financial stability: the future,

New York, NY: Pace University, 1985.

- Keen, P.G.W. and El-Sherif, H., "An accelerated development strategy for applying DSS in developing countries", presented at the second international conference on DSS, San Francisco (Calif), 1982.
- Keen, P.G.W. and Woodman, Lunda A., What to do with all those micros", Harvard Business Review, 62,5 September - October 1988.
- Keen, P.G.W., "Information systems and organizational change", International Center for Information Technology, 1980.
- Keen, P.G.W., Decision Support Systems: The Next Decade, Decision Support Systems, September 1987, 3(3), pp 253-265.
- Keen, P.G.W., Value Analysis; Justifying Decision Support Systems, MIS Quarterly, March 1981, 5(1), pp 1-15.
- Keen, Peter G. W. " Interactive Computer Systems for Management: A Modest Proposal." Sloan Management Review, Vol. 18 (Fall 1976).
- Keen, Peter G. W. and M.S. Scott Morton. Decision Support Systems: An Organizational Prespective. Reading, Mass.: Addison-Wesley, 1982.
- Keen, Peter G. W. and Morton, Michael S. Scott, Decision support systems: an organizational perspective, Mass.: Addison Wesley, 1978.
- Khosrowpour, Mehdi., Information Technology and Organizations: Challenges of New Technologies, Harrisburg, A., U.S.A.: Idea Group Pub., 1994.
- Kim, L., and Letterback, J.M., "The evolution or organizational structure and technology in a developing country", Management Science, 29, October 1983.
- King, Donald W., Roderer, Nancy K., and Harold A. Olsen, Key papers in the economics of information, White Plains, N.Y., 1983.
- King, J.L. and Kramer, K.L., "Implementation of strategic information systems" in Kenneth C. Laudon and Jon A. Turner (eds.) information technology and management strategy, Engiewood Cliffs: Prontiee

Hall, 1989.

- King, W.R. and Rodriguez, Jamie I., "Participative design of strategic decision support systems: an empirical approach", Management Scienece, 27,6, June 1981.
- Kiss, Judit, Sentenced to debt: African debt crisis: facts, causes and remedies, Budapest : Institute for world economics of the Hungarian Academy of Science, 1991.
- Klein, Heinz K. and Hirschheim, Rudy, "Social change and the future of information systems development" in Richard Boland and Rudy Hirschheim (eds.), Critical Issues in Information Systems Research, 1987 pp 275-305.
- Klein, Michel and Methlie, Leif B., Expert systems: a decision support approach with application in Management and Finance, Wokingham : Addison - Wesley, 1990.
- Klein, Thomas M. (ed.), Managing external debt in developing countries: Proceedings of a joint seminar, Jeddah, World Bank Discussion Paper, 1992, no. 155 , pp 237.
- Kotlikoff, Laurence J., Economic Impact of Deficit Financing, International Monetary Fund Staff Paper, September 1984, 31(3), pp 549-82.
- Kraemer, Kenneth L. and King, John Leslie, Computer-based models for policy making: Uses and impacts in the US federal Government, Operations Research, July-August 1986, 34(4), pp 501-512.
- Kraemer, Kenneth L., and John Leslie King. " Computer-Based Systems for Cooperative Work and Group Decision Making." ACM Computing Surveys (June 1988).
- Kroner, Ken and Claessens, Stijn, Improving the currency composition of external debt, Washington D.C.: International Economic Department, World Bank, 1989.
- Kuutti, K., The theory of activity and its applications on IS research,

ISRA 1990.

- Lancaster, Carol, African economic reform: the external dimension, Washington, D.C.: Institute for International Economics, 1991.
- Land, F. "Adapting to changing user requirements", Information & Management, 5, 1982.
- Lasden, M., Decision Support Systems: Mission Accomplished?, Computer Decisions, April 6, 1987 pp 41-42.
- Laudon, Kenneth C. (Kenneth Craig), Computers and bureaucratic reform: the political functions of urban information systems, Wiley-Interscience, New York; London: 1974.
- Laudon, Kenneth C., Communication Technology Democratic Participation. New York: Praeger Publications, 1977.
- Laudon, Kenneth C., Dossier society : value choices in the design of national information systems, Columbia University Press, New York, 1986.
- Laudon, Kenneth c., Management Information Systems: Organization and Technology, New York: Macmillan Pub. Co.; Toronto: Maxwell Macmillan International, 1994, (3rd ed).
- Le Moigne, J.L. and Van Gigch, J.P., "The design of an organization information systems", Information & Management, 19, 1990.
- Lederer, A.L. and Mendelow, A.L., "Issues in IS planning", Information & Managment, 10, 1986.
- Lederer, A.L. and Sethi, V., "Critical dimensions of strategic information systems planning", Decision Sciences, 22, Winter 1991.
- Leifer, R., "Matching computer-based information systems with organational structure", MIS Quarterly, 12, March 1988.
- Leonard – Barton, D., and Deschamps, I., "Managerial influence in the implementation of new technology", Management Science, 34, October 1988.
- Levin, Jonathan, The management of public debt in developing

countries, finance and development, June 1970, 7(2), pp 29-37.

- Lind, P., "Computers, Myths and Development", Information Techology for Development, 1,2, 1986.
- Lind, P., Computerization in developing countries: Models and reality, Routledge, London 1991.
- Lockett, A. G. and Lslei, G. (eds.), Improving decision making in organizations: Proceedings of the Eight's International Conference on Multiple Criteria Decision Making, Berlin: Springer, 1989.
- Lomax, David F., The developing country debt crisis, Basingstoke: Macmillan, 1986.
- Lombardi, Richard W., Debt trap: rethinking the logic of development, New York: Praeger, 1985.
- Lotfi, Vahid., Decision Support Systems for Operations Management and Management Science, Chicago: Irwin, 1996.
- Loxley, John, Debt and disorder: external financing for development, Boulder: Westview Press, 1986.
- Luckett, Dudley G. and Murray, Michael P., Liquidity Impact of Debt Management: Comment, Southern Economic Journal, April 1972, 38(4), pp 581-84.
- MacDonald, Scott B. , Lindsay, Margie and Crum, David L. (eds.), The global debt crisis : Forecasting for the future, London : Pinter , 1990.
- MacEwan, Arthur, Debt and disorder: International economic instability and U.S. imperial decline, New York: Monthly Review Press, 1990.
- Marcel, Mario and Palma, Gabriel, The debt crisis: the Third World and British banks, London: Fabian Society, 1987.
- Markus, M.L., "Power, politics and MIS implementation", Communications of the ACM, 26,6 June 1983.
- Markus, M.L., and Robey, D., "Information technology &

organizational change: Causal structure on theory & research", Management Science, 34, May 1988.

- Markus, M.L., and Robey,D., "The organizational impacts of information systems: Models and research directions, Parper presented at the TIMS/ORSA meeting, Los Angeles, April 1986.
- McCosh, Andrew M. and Morton, Michael S. Scott, Management decision support systems, London: Macmillan, 1978.
- McFarlan, F. William (ed.), The Information Systems Research Challenge (Proceedings of the Harvard Business School Research Colloquim), Boston: Harvard Business School Press, 1985.
- Mclean, Ephraim R. and Sol., Henk G. (eds.), IFIP WG 8.3 Working Conference on Decision Support Systems: a Decadein Perspective, Amsterdam: North Holland - Noordwijkerhout, 1986.
- McNurlin, B.C. and Sprague, R.H., Jr., (eds.) Information systems management in practice, Englewood cliffs: Prentice-Hall, 1986.
- Meador, C.L. and Ness., D.N., "Decision Support Systems: An application to corpate planning" , Sloan Management Review, Vol 15, No. 2, Winter 1974.
- Meador, C.L., Guyote, M.J. and Rosenfeld, W.L., "Decision support planning and analysis: the problems of getting large-scale DSS started", MIS Quarterly, 10,2 1986.
- Meador, Charles L. and Peter G. W. Keen " Setting Priorities for DSS Development." MIS Quarterly (June 1984). Sanders, G. Lawrance, and James F. Courtney. "A Field Study of Organizational Factors Influencing DSS Success." MIS Quarterly (March 1985).
- Mehran, Hassanali "External Debt Management", International Monetary Fund, Washington, D.C., 1985.
- Meissner, Charles F., Debt: reform without governments [Third World debt management], Foreign Policy, Fall 1984 pp 81-93.
- Michl, Thomas R., Debt, Deficits, and the Distribution of Income,

Journal of Post Keynesian Economics, Spring 1991, 13(3), pp 351-65.

- Milesi-Ferretti, Gian Maria, Do good or do well?: Public debt management in a two-party economy, London: The London School of Economics and Political Science. Center for Economic Performance, 1991.
- Milivojevic, Marko, The debt rescheduling process, London: Pinter, 1985.
- Miller, Morris, Coping is not enough! The international debt crisis and the roles of the World Bank and International Monetary Fund, Homewood, 111. : Dow Jones-Irwin, 1986.
- Mittra, Sitansu S , Decision support systems : tools and techniques, New York: Wiley , 1986.
- Mockler, R.J., Knowledge - based systems for management decisions, Englewood Cliffs: Prentice - Hall, 1989.
- Mohammed, Aziz Ali F., The case by case approach to debt problems: the International Monetary Fund's recent role in debt management, Finance and Development: a quarterly publication of the International Monetary fund and the World Bank, March 1985, 22, pp 27-30.
- Moussa, A. and Schware, R., "Informatics in Africa: Lessons from World Bank Experience", World Development, 20, 12, 1992.
- Muehring, Kevin, Debt management's new frontier, Government Finance, February 1989 pp 49-51.
- Munasinghe, M. "Computer and informatics issues, and policy for third world development", Information Technology for Development, 2,4, 1987.
- Munasinghe, M. Computers and Informatics in Developing Countries, Butterworths, 1989.
- Murdich, R.G., MIS concepts & design, Englewoods Cliffs: Prentice-Hall, 1980.

- Nagul, Stuart S., Applications of decision-aiding software, Basingstoke : Macmillan Academic and Professional , 1992.
- Naya, Seiji, Effects of external shocks on the balance of payments, policy responses debt problems of Asian developing countries, Manila : Asian Developing Bank, 1983.
- Nelson, D.L., "Individual adjustments to information - deiven techologies: a critical view", MIS Quarterly, 14, March 1990.
- Ngwenyama, O.K., "The critical social theory approach to information systems: problems and challenges" in Hans - Erik Nissen (ed.) The Information Systems Research Arena of the 90s, Challenges, Perceptions and Alternative Approaches Amsterdam: North Holland, 1991.
- Nowzad, Bahram, External Indebtness of developing countries, Washington, D.C. : IMF, 1981.
- O'brien, James A., Introduction to Information Systems, Boston: Irwin, 1997, (8th ed).
- Odedra, M and Modon, S., Information Technology Policies and Applications in the Commonwealth Developing Countries, London: The Commonwealth Secretariat, 1993.
- Odedra, M.R, Lawrie, M., Benet, M and Goodman, S., "Sub-Saharan Africa: A Technological Desert", Communications of the ACM, Vol 36, No. 2, February 1993.
- Odedra, Mayuri, Information technology transfer to developing countries: is it really taking place?, Lonon: Department of Information Systems, The London School of Economics and Political Science, 1990.
- Ohlin, Goran, Aid an indeptedness: the relation between ai requirements, terms of assistance and indebtedness of developing countries, Paris: OECD, 1966.
- Oiro, Sam , Debt crisis : are debt-for-nature swaps an answer ?,

Nairobi : Environment Liaison Centre International, 1989.

- Olaloku, F. A., Debt, development and the Thrid World: the issue and the choice, Lagos: University of Lagos Press, 1991.
- Olusanya, G.O. (ed.), The African debt Crisis, Lagos, Nigeria: Nigerian Institute of International Affairs, 1989.
- Onimode, Bade (ed.), The IMF, the World Bank and African debt, London: Zed, 1989.
- Orlikowski, W.J. and Robey, D., "Information Technology and the structuring of organizations", Information Systems Research, 2,2, June 1991.
- Orlikowski, Wanda J., "Duality in Technology", MIT Sloan School of Management Working Paper, 1988 .
- Paller, A. , Executive Information Systems Should Do More than Just Identify Problems, Information Center, February 1988, 4(2), pp 16-17.
- Palvia, P., Pavlia, S. and Zigli, R.M., "Modes and requirements for using strategic information systems in developing nations", International Jourhal of Information Management, 10, 1990, pp 117-126.
- Paredes, Mariana and Tamez, Imelda, Country Presentation by Participants from Mexico, Debt Management Systems, pp 153-162.
- Pfeffermann, Guy P. and Mehran, Hassan Ali (eds.), World Bank Policies in Relation to external Debt of Memeber Countries, External Debt Management: Paper Presented at a Seminar Organized by the IMF Institute and the Central Banking Department of the IMF, 1984, 1985 pp 53-64.
- Pieptea, D. and Anderson, E., Price and Value of Decision Support Systems, MIS Quarterly, December 1987, 11(4), pp 515-528.
- Proceedings of a seminar on external debt management, jointly organized by the Islamic Research & Training Institute of the Islamic Development Bank, Jeddah, Saudi Arabia and the World Bank

Washington D.C., USA Jeddah, May 12 - 16, 1990.

- Ranis, Gustav, Adjustment, growth, and debt fatigue: can the case-by-case and global approaches be combined?, San Francisco: International Center For Economics Growth, 1989.
- Rasmussen, Jens, Brehmer, Berndt and Leplat, Jacques (eds.), Distributed decision making: cognitive models for cooperative work, Chichester : Wiley , 1990.
- Reisen, Helmut and Trotsenburg, Axel von, Developing country debt: The budgetary and transfer problem, Paris: Organization for economic Co-operation and Development, 1988.
- Robey D., "Implementation and the organizational impacts of IS", Interfaces, 17,3, May-June 1987.
- Robey, Daniel, Implementation and the organizational impacts of information systems, Interfaces, May-June 1987 , 17(3) , pp 72-84.
- Robey, Daniel, Implementation and the organizational impacts of information systems, Interfaces, May-June 1987, 17(3), pp 72-84.
- Rockart, J.F. and Delong, D.W., Executive Support Systems, 1988.
- Rockart, John F., " Chief Executives Define Their Own Data Needs." Harvard Business Review (March - April 1979).
- Roy, Kartik Chandra and Sen, Raj K., On the Domestic Debt and Its Effects on LDC's Internal and External Balance, Rivista Internazionale di Scienze Economiche e Commerciali, Oct.-Nov. 1991, 38(10-11), pp 1003-13.
- Rubin, Steven M. , Guide to Debt Equity Swaps: Special Report No. 1104, September 1987 p 213.
- Sachs, Jeffrey d. (ed.), Developing country debt and economic performance, London: University of Chicago Press, 1990.
- Sachs, Jeffrey D. and Collins, Susan M. (eds.), Developing country debt and economic performance. Country studies - Indonesia, Korea, Philippines, and Turkey, National Bureau of Economic

Research Project Report series, 1989, v.3, pp x, 821.

- Sautter, Hermann, Economic and ethical aspects of the international debt problem, Lagos: Nigerian Institute of International Affairs, 1990.
- Schatan, Jacobo , World debt: who is to pay, London : Zed, 1987.
- Schware, R. and Choudhury, Z., "Aid agencies and information technology development", Information Technology for Development, 3,2, 1988.
- Scott Morton, M.S., and "The state of the art research", in F. William McFarlan (ed.), The information systems research challenge (Proceedings of the Harvard Business School Research Colloquium) Boston: Harvard Business School Press, 1985.
- Scott Morton, M.S., The state of the research, the information research challenge, F. Warren Mcfarlan (ed.), Harvard Business School Press, Boston, Mass, 1984.
- Scott, W.R., "Techology and structure: an organizational level perspective". in P.S. Goodman, L.S. Sproul and Associates (eds.), Technology 1990.
- Sevingny, David, The Paris Club: an inside view, Ohawa: North South Institute, 1990.
- Shakun, Melvin F., Evolutionary systems design: policy making under complexity and group decision support systems, Oakland: Holden-Day, 1988.
- Shields, Roger E., Aspects of current international debt problems: is the problem insolvency or illiquidity, Washington, D.C.: American Institute For Public Policy Research, 1985.
- Singer, H.W and Sharma, Soumitra (eds.), Growth and external debt management, Twenty-two papers presented at the International Conference of Economists held in Zagreb, Yugoslavia, 1989 pp xv, 279.

- Sol., Hank G. (ed.), Processes and tools for decision support, Amsterdam: North Holland, 1983.
- Solomon, Anthony M., The dollar, debt, and the trade deficit, New York: New York University Press, 1986.
- Sprague Jr., Ralph H. and Watson, Hugh J. (eds.), Decision support systems: Putting theory into practice, Englewood cliffs, N.J.: Prentice - Hall, 1986.
- Sprague, R. H., and E. D. Carlson. Building Effective Decision Support Systems. Englewood Cliffs, N.J.: Prentice-Hall, 1982.
- Sprague, R.H. and Watson, H.J. (eds.), Decision Support Systems: Putting Theory into Practice, 1986.
- Sprague, R.H., Jr. "A framework for the development of decision support systems", MIS Quarterly, Vol 4, No.4, December 1980.
- Sprague, R.H., Jr. and Watson, H.J., (eds.) Decision support systems, Englewood Cliffs: Prentice- Hall, 1986.
- Stover, W.J., Information technology in the third world, Boulder, Colo: Westview Press 1984.
- Strack, Dieter and Schonherr, Siegfried (eds.), Debt Survey of developing countries: an improved reporting system approach, Munchen: Weltforum Verlag, 1989.
- Strack, Dieter and Schonherr, Siegfried (eds.), Debt survey of developing countries, Boulder: Westview , 1990.
- Straub, D.W. and Wetherbe, James C., "Information technologies for the 1990's: an organizational impact perspective", Communications of the ACM, 32, November 1989.
- Swanson, E.B., and Beath, C.M., "Reconstructing the systems development organization", MIS Quarterly, 13, September 1989.
- Synott, Thomas W., The Debt Explosion of the 1980s: Problem and Opportunity, Business Economics, January 1991, 26(1), pp 48-51.
- Tait, P., "The effects of user involvement on system success: a

contingency approach", MIS Quarterly, 12, March 1988.

- Tanzi, Vito , Blejer, Mario I. and Arrow, Kenneth J. (eds.), Public Debt and Fiscal policy in Developing Countries, The economics of public debt: proceeding of a conference held by the International Economic Association at Stanford, California, 1988 pp 230-63.
- Tanzi, Vito , Fiscal Management and External Debt Problems, Debt Management Systems, pp 66-87.
- Tanzi, Vito and Herber, Bernard P. (eds.), Is There a Limit to the Size of Fiscal Deficits in Developing Countries?, Public finance and public debt: Proceedings of the 40th Congress of the International Institute of Public Finance, Innsbruck, 1984, 1986 pp 139-52.
- Tavakolian, H. "Linking the IT structure with organizational competitive strategy: a survey", MIS Quarterly, 13, September 1989.
- Trauth, Eileen M. and O'Connor, Barbara, "A study of the interaction between information technology and society: an illustration of combined qualitative research methods" in Hans-Erik Nissen (ed.), The Information Systems Research Arena of the 90's, Challenges, Perceptions and Alternatives Approaches, 1991 .
- Trichet, Jean Claude and Mehran, Hassan Ali (eds.), Official Debt Rescheduling, External Debt Management: Paper Presented at a Seminar Organized by the IMf Institute and the Central Banking Department of the IMF, 1984, 1985 pp 126-36.
- Trichet, Jean Claude, Official Debt Rescheduling, Debt Management Systems, pp 126-136.
- Turban, Efraim., Decision Support and Expert Systems. New York: Macmillan, 1988.
- Turnovsky, Stephen J, and Sen, Partha, Fiscal Policy, Capital Accumulation, and Debt in an Open Economy, Oxford Economic Papers, N. S., January 1991, 4391) , pp 1-24.
- UNCTAD, Debt Management and Financial Analysis - The UNCTAD

Programme Progress Report 1987, United Nation Conference on Trade and Development, February 1988 p 11.

- UNCTAD, Effective Debt Management, August 1988.
- UNCTAD, UNCTAD Debt Monitoring and Financial Analysis system., United Nations Conference on Trade and Development, 6 November 1985 p 35.
- UNDP, External Debt and Resources Management - Regional Project of the African Region, 31 March 1988.
- United Nations Development Programme, Debt Management and the Developing Countries, A report to the United Nations Development Programme by an independent group of experts, July 1989.
- United Nations Library, Debt problems of developing countries, Geneva: The Library, 1979.
- United Nations, Financing Africa's Recovery: Report and Recommendations of the Advisory Group on Financial Flow for Africa, 22 February 1988 p 59.
- United Nations, The Evolution of the external debt problem in latin America and the Caribbean, Santiago, Chile: United Nations, Economic Commission for Latin America and the Caribbean, 1988.
- Valantin, Robert, Computer-Based Systems to Meet Debt Management Information Needs, World Bank Debt Systems Conference, April 1989.
- Vallely, Paul, Bad samaritans: First World ethics and Third World debt, London: Hodder & Stoughon, 1990.
- Vichyanond, Pakorn, External debt management and economic growth: a case study of Thailand in the 1970s, Ph.D. Thesis, 1981.
- Vitale, M., Ives, B. and Beath, C., "Identifying strategic information systems: Finding a process or building and organization?" In Kenneth C. Laudon and Jon A. Turner (eds.) information technology

and management strategy, Englewood Cliffs: Prentice Hall, 1989.

- Vitale, Michael R., "The Growing risks of IS success", MIS Quarterly, 4, 1986.
- Waema, T.M. and Walsham, G., "Information systems strategy formulation", Information & Management, 18, 1990.
- Waema, T.M. and Walsham, G., "Information systems strategy formulation", Information & Management, 18, 1990.
- Walsham, Geoff , "Metaphors of information", European Journal of Information Systems, 1991 , 1,2 .
- Warburg, S.G. and Co. Ltd. , Debt Analysis and Management System "DAMS", January 1987 p 11.
- Warner, Tony., Communication Skills for Information Systems, London: Pitman Publishing, 1996.
- Waston, R.T. and Brancheau J.C., "Key issues in information systems management", Information & Mangement, 20,1991.
- Watkins, Alfred J., Till debt do us part: who loses, and who pays for the international debt crisis, London: University Press of Americ, 1987.
- Weeks, John F. (ed.), Debt disaster?: Banks, government, and multinationals confront the crisis, New York: New York University Press , 1989.
- Whitley, Edgar, Expert systems: true support for the process of decision making, London: Department of Information Systems, The London School of Economics and Political Science, 1990.
- Wijnhoven, A.B.J.M. and Wassenar, D.A., "Impact of IT on organizations: the state of the art", International Jounrnal of Information Management, 10, 1990.
- Wildavsky, A., "Information as an organizational problem", Journal of Management Studies, 20,1, 1983.
- Woodward, David, Debt, adjustment, and poverty in developing countries: The impact of debt, London: Pinter Publishers, 1992.

- World Bank, "Debt Management Systems," World Bank Discussion Papers, 1990, no. 108, pp 224.
- World Bank, Debt Management System / Debt and International Finance Division, Washington, D.C. : World Bank, 1990.
- World Bank, Debt Management system / Debt and International Finance Division, Washington, D.C : World Bank, 1990.
- World Bank, Debt management systems, World Bank Discussion Papers, 1990, no. 108 , pp ix, 224.
- World Bank, Debt System Conference Proceeding, 1985 p 150.
- World Bank, Developing countries: medium-term prospects / a paper prepared by the staff of the World Bank for the Development Committee, Washington, D.C.: Joint Ministerial Committee of the Boards of Governors of the World Bank and IMF, 1985.
- World Bank, World Bank Debt reporting system manual, Washington, D.C. : World Bank, 1980.
- World Bank, World Debt Tables: 1991, pp xvi, 665.
- Yaverbaum, G.J., "Critical factors in the user involvement: an experimental_study of users, organizations, taskes", MIS Quartererly, 12, March 1988.
- Yin, R.K., Case study research: Design and methods, Sage publications, Beverly Hills, Ca, 1984.
- Zhang, Bingxun and Angell, Ian O., Decision Support Systems in China: a clash of cultures, New York: Quorum, 1989.
- Zloch Christy, liana, Debt problems of Eastern Europe, Soviet and East European studies series, 1987 pp xix, 220.
- Zmud, R., Supporting senior executives through decision support technologies: A review and directions for future research, decision support systems: A decade in perspective, E.R. Mclean and H.G. Sol (eds.), 1986 pp 87-101.